

The Iron Age

A Review of the Hardware and Metal Trades.

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Palmer's Power Spring Hammer.

The accompanying illustration presents a side elevation of Palmer's Power Spring Hammer, invented by Mr. James Palmer, and manufactured by Messrs. S. C. Forsyth & Co., Manchester, New Hampshire. The great advantage claimed for this hammer is that it can be operated by the same power used to run the works, without additional machinery or attendance, and is under such perfect control that it will deliver any weight of blow required. The smallest size will deliver 500 strokes a minute, and is especially adapted to forging cutlery of all descriptions, bowls of spoons, small hardware, jewelry, &c. The medium size is designed for the use of a general forge shop, and will strike 250 blows a minute. The largest forms, it is believed, are as well adapted to all classes of work as the steam hammer, while they are free from the expense attending the use of the latter.

When employed in the manufacture of drop forgings the dies are made in the usual manner, and are keyed in position. The machine is driven by a friction pulley sliding on a splint in the shaft, the belted pulley being loose on the latter. The friction pulley is operated by a forked clutch worked by the right angled levers attached to the long foot lever, which is bent around the fore part of the hammer so as to be accessible on both sides and front of the apparatus. The shaft has a crank forged in the center and carries upon it a connection which extends to a leaved spring. On the other end of the spring is attached the hammer head, in which is keyed the top die. The spring works upon the bearings of a flat rocker shaft, to which it is securely bolted.

The operations are as follows: The iron being heated and placed upon the die, the forger places his foot on the treadle to depress it, thus drawing down the arm that moves the clutch friction into the running loose pulley. The crank is thus revolved, drawing down the spring which carries up the hammer head, and producing by its velocity a vibration of the spring in which the blow given is in proportion to the velocity in which the crank revolves. It is aptly illustrated by cracking a whip. To forge a long rod or scythe, an aperture cast through the body of the upright part so as to allow the work to be passed lengthwise the forging dies is provided. The slightest pressure of the foot on the treadle is easily observable in the working of the machine, but the head never allows the dies to meet until there is velocity enough to produce the requisite vibration of the spring. The balance wheel, on the end of the crank shaft, acts in two capacities, the wheel having a balance placed within its rim to counteract the weight of hammer head, thus allowing the hammer to stop in any position in which the friction may leave it, thereby preventing the weight of the hammer head from always resting on the lower die when stopped; and the momentum of the wheel keeps the machine perfectly steady when running, and prevents, by the balance within its rim, that oscillating movement of frame which would be the result of the blow if not thus balanced.

There are, we learn, a considerable number of these hammers now in operation in various parts of the country, doing all classes of forging, from the smallest forks upward.

Directions for the Use of Nitro-Glycerine in Rock Excavations.

The following letter from Col. G. H. Ellers, C. E., on the use of nitro-glycerine, will be of interest to those engaged in iron mining:

MY DEAR SIR: I have the honor to acknowledge the receipt of your communication of the 21st instant, and in response thereto, beg leave to say that in such material as you describe, cemented or indurated earth, hard pan, etc., etc., the use of nitro-glycerine will scarcely be found as economical as powder. In the older rocks, granite, gneiss, limestone, quartz, etc., nitro-glycerine will do the work at fully half the cost as compared with the best blasting powder. There are many different qualities of nitro-glycerine, varying fully fifty per cent. in power and purity, and, while the pure article is perfectly safe, and does not readily change in store or magazine, the spontaneous explosion of an impure article is merely a question of time and temperature. There are many circumstances controlling the use of this most valuable explosive agent, a proper knowledge of which will often save both time and money; for instance, a diffusion of ten per cent. of water will diminish its blasting power thirty per cent., while an increased power of fully thirty per cent. is obtained by charging directly in the drill hole over what is evolved, when the metallic shell of the cartridge and a stratum of air and water are interposed between the gases of explosion and the rock acted upon. I am unable to say how much loose earth a given charge will move or throw down, never having used it in anything but rock and large erratic

boulders, and I know of no one from whom such information can be obtained. As I have already said, the maximum useful effect of nitro-glycerine, as a blasting agent, is reached in the older and harder rocks; in loose material it is not so effective. The following are substantially Mr. Mowbray's instructions for use and handling, and he probably knows more about the subject than any man in America:

1. Handle with the greatest care, avoiding every possible jar or concussion, and be very careful, if any is spilled outside the can, to avoid striking it with or against any hard substance.

2. When in a solid state, thaw out by placing the cans in a vessel of warm water, never warmer than the wrist can bear, first pouring some of the warm water from the vessel into the can, and always removing the can or cans before adding more warm water to that in the vessel in which the cans are placed.

3. When filling cartridges hold them carefully over a tray, about 2 x 3, the bottom of which

to orders and compel the adoption of every precaution to prevent accidents or explosions.

12. Never use empty cans for other purposes, transport them to a safe place, and then destroy them by fire, or with a fuse and exploder.

13. Carefully examine the cans from time to time, and notice if any pin holes have been eaten through at the level of the nitro-glycerine therein. Should the presence of such holes be detected, procure new cans or stone jars, and place the contents of the unsound cans therein, never trusting your hold on the upper portion of the unsound cans, lest it break loose and trouble ensue.

14. When congealed, nitro-glycerine is absolutely safe; if possible, therefore, it should always be stored surrounded with ice, since explosion is impossible when in a solid state.

The present price is about \$1.65 per pound delivered—the electric exploders are about 30c. for 10 feet wires, and 25c. for 8 feet wires. Some changes in these figures may be made about the first of next month. If you have any

mirable for their several purposes. There is one elevator, however, the most rapid in action of any other, and which, so far as we are informed, has not yet been adopted in buildings in the United States, if, indeed, it is used in other localities. We refer to what is known by the very indefinite name of "man engine," and which is in use in some of the deepest mines in Europe. It consists of a strong, movable platform, to be made light and ornamental if desired, properly guarded, for each story to be ascended, which platforms are hung by strong wire ropes, or iron chains, from a large drum immediately under the main roof, or in a square tower, over an offset appropriated to such elevator. By a continual oscillation of this drum, for a distance equal to the height of a story, easily accomplished by a small steam engine, the series of platforms, perhaps eight or ten in number, and descending to the lowest cellars, rise and fall always one story with perfect regularity, and needs no attendant or check wires. The

of them in such places is generally of the rudest and most unguarded description. The chief advantage is, being always at hand for use and in action; in fact, the ascension or descension is made as by a series of gigantic strides, through the aid of steam-power. Hotels adopting this system would, we believe, reap profit from it in the several ways already mentioned. The machines, also, are not expensive in construction, and there is no patent right upon them.

The Calumet and Hecla Mines.

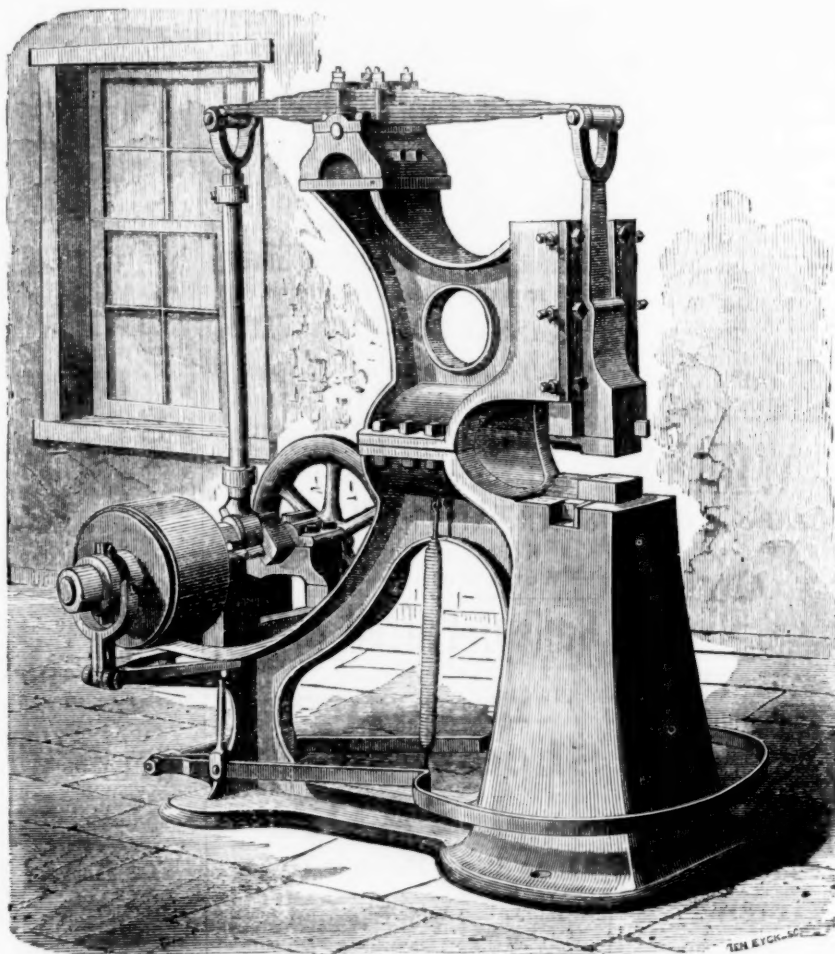
The *Northeastern Mining Journal* enters upon an analysis of the business and finances of the Calumet and Hecla Mining Company, from which we take the following:

Although the sales for the year were made at an average of 26-40 cents per pound, the actual product for the financial year of the company, ending May 1, 1874, averaged but 22-63 cents, as 8,870,281 pounds were on hand at that date, and valued at only 18 cents per pound at the time of making the financial statement at the annual meeting in August. With these necessary explanations the following figures are presented to show the cost per pound of copper marketed, that is, including every expense to which the company is liable in conducting its business.

Total sales for year, May 1, 1873, to May 1, 1874.	18,392,028 lbs.	
Copper on hand May 1, 1873.	7,507,255 "	
Sales from the year's product.	16,884,773 at 26-40 cts.	\$2,873,032-07
Copper on hand May 1, 1874.	8,870,281 lbs. at 18c.	1,596,650-58
Total product in stock, May 1, 1873, to May 1, 1874.	19,755,054 lbs. at 22-63c.	\$4,469,702-65
Surplus on hand May 1, 1873.		1,866,507-34
		\$6,339,539-99
Surplus on hand May 1, 1874.		\$2,253,545-13
Paid in dividends during the year, \$30 per share on 80,000 shares.	1,600,000-00	3,853,545-13
Cost of producing copper for the year, say 19,755,054 lbs. at 12-37 cts. per lb. marketed.		\$2,482,664-56
The earnings for the year were.		\$4,469,702-65
Total expenses for the year.		2,482,664-56
Net earnings of the mine.		\$1,987,037-79

It will be seen that the copper actually sold within the year, from May 1, 1873, to May 1, 1874, falls considerably short of the precise product of the mine for that period; but another season the figures might be reversed in consequence of the amount on hand varying largely, the difference being 1,363,026 pounds in the two periods above given. Our calculations are based on figures given out officially by the company, and although the result is arrived at by a different process from what it would be with a report as ordinarily made by a mining company, we are confident that we are substantially correct, and do not believe any official showing can increase the cost of production, while a fair exhibit might even reduce it slightly. The figures given prove that the copper was marketed last year at 12½ cents per pound, and there certainly is no good reason why it should cost any more this season, with a prospect that a little reduction may be made even on this low figure. This is at least five cents per pound lower than the average price at which any other mine has yet been able to market copper; this advantage alone being equal to a net profit of \$1,000,000 per annum. And herein lies the secret of the company's great success; the unusual richness of the copper bearing rock, and the facility for mining the immense quantity of more than 1000 tons of mineral per month on an average, thus securing the production of ingot copper at a minimum price heretofore unknown in Lake Superior mining.

The question may be asked why the net profit is not 13-83 cents per pound if the average price obtained was 26-40 cents and the cost only 12-57 cents. In order to make this clearly understood beyond question, we here recapitulate some of the figures above given. The fact is, the product of 1873 was not marketed at that figure, only 10,884,773 pounds, as above shown; while the balance, 8,870,281 pounds, was on hand at the close of the fiscal year (April 30, 1874), and valued at 18 cents, consequently the average price for the year's product was only 22-63 cents, provided the amount on hand should be marketed no better than 18 cents. The "amount on hand" May 1, 1873 (7,507,255 lbs.), was then valued at 27 cents per pound, and afterward sold at 26-40 cents, showing a loss on the estimate of only six-tenths of one cent per pound. On this year's balance the promise is a gain; in fact, some of the copper, we understand, had been actually sold at an advance on the estimated value previous to the annual meeting, and the recent improvement in ingot assures a further profit on the portion unsold.



PALMER'S POWER SPRING HAMMER.

must be thoroughly covered with "plaster of Paris," which latter must be replaced as rapidly as lightly saturated with the nitro-glycerine. (Memo., plaster of Paris saturated with nitro-glycerine does not readily explode.)

4. If necessary to store glycerine in a liquid state for any length of time, insert the cork loosely, and pour a pint of cold water in each can, which water must be frequently and carefully poured off and replaced with fresh cold water in warm weather, always taking care to retain the bladder under the cork. If ice can be procured, however, it is both safer and more desirable to congeal the nitro-glycerine and keep it in the solid state.

5. Use gutta percha funnels for filling water holes—never tamp the drill holes, it is totally unnecessary and is pretty sure to kill the individual who does it.

6. Never use hot irons to warm the water, or for soldering the cans, both are sure to cause explosion.

7. Never sledge or drill in a hole or seam where nitro-glycerine has been spilled, without first firing an exploder to clean the place out.

8. Never pour nitro-glycerine into a hole, unless perfectly sure that the hole is sound and will hold water; if otherwise, always use a cartridge.

9. To obtain the best results, use drill holes always six feet in depth, or over, fire with powerful exploders and well insulated wire, by electric battery and with simultaneous explosion.

10. After a blast, look carefully for any unexploded cartridges that may be laying around loose.

11. Allow none but the most careful, competent and sober persons to handle or have charge of nitro-glycerine, and enforce a rigid obedience

important work on hand requiring the use of nitro-glycerine, or of a difficult or dangerous character, I shall be most happy to undertake it at any time.

Trusting the foregoing may meet your requirements, I am, etc., very cordially yours.

(Signed) G. HOWARD ELLERS,
Chief Engineer.

Troy and West Troy Bridge Co.,
Chief Engineer's Office, Troy, N. Y., May 25, 1874.

Elevators.

The *American Exchange and Review* says: The great elevation of modern hotels, and the natural desire of their proprietors to make the upper stories profitable, lend much importance to the subject of rapid access to those higher regions. Every year increases the number of families that, disgusted with the troubles of house keeping, seek refuge in suites of rooms at hotels. This still drives higher and higher that respectable class of boarders called bachelors, also rising young men, and such casual travelers as are deficient of certain influence or importance. If a quick mode of access to the highest stories could be devised, the latter would become as profitable, or nearly so, as the lower portions, which now is far from being the fact. The present style of box or room elevator in use at the best hotels is good, except in being too slow in motion, and we would not advocate its disuse, because, for ladies and children especially, it is a great advantage; but we hope to see the rate of speed increased without injury to safety. Beside this kind, there are now constructed open elevators, recently greatly improved in form and speed, and ad-

working, therefore, is of the simplest nature. To ascend, you enter the platform of the first floor, which immediately ascends to the second story—stops there a moment, to allow you to step off and others to enter upon it, when it descends. During the fifteen seconds, or thereabouts, of waiting upon the landing, the next platform above has, by the descending motion, come to the level of the second floor; stepping upon it, one is immediately raised to the third floor, where, landing again, the advent of another platform from above will raise the occupant to the fourth story, or, in succession, to any height that a building can be erected. By this mode, the ascent or descent can be made in about one-third the time of ascent or descent on foot, and without the least fatigue, while there is scarcely a possibility of the machine becoming disarranged, or of a platform falling. This elevator is not recommended for ladies and children, but for gentlemen, to whom time is valuable, and who appreciate the exhaustion caused by ascending many flights of stairs. By its use much time would be saved to employees of hotels and in the transit of baggage to rooms. It could easily be arranged alongside the regular box elevator, and actuated by the same engine. Aided by such arrangement, many gentlemen would as willingly live in the highest as in the lower stories—the former being always cooler and more quiet in summer time, and also, in many locations, not troubled with mosquitoes, when the lower stories are infested with them. The higher, also, the location of sleeping rooms, the less danger is there from any kind of malaria, if not from fires. Such elevators could be made very useful in tall factories and sugar refineries, by saving time in the transit of employees; and in deep mines their value has been well proved in Europe, though the construction

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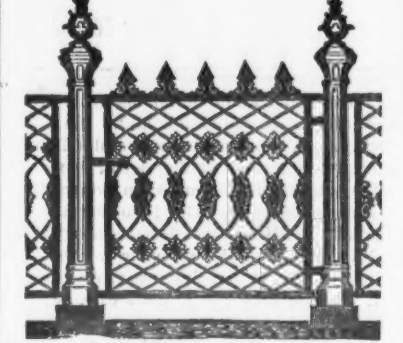
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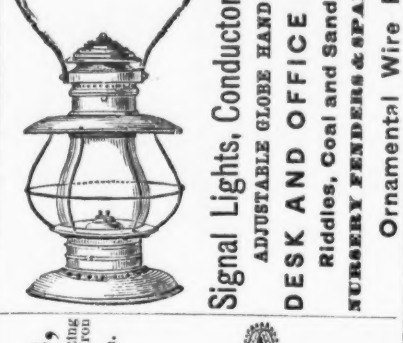
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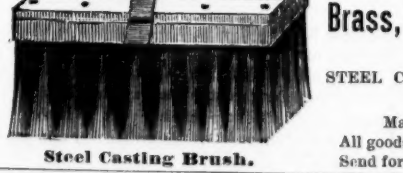
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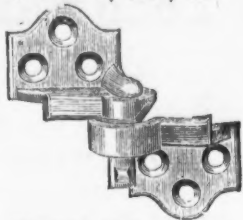
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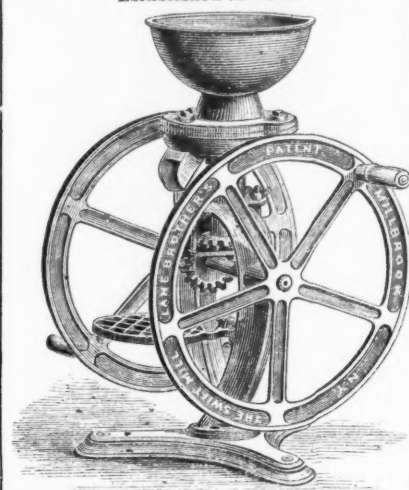
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The Warner Process.

The following is an abstract of the claims of
an English patentee for the purification of iron
by what is known as the Warner process, in-
vented by Mr. Arthur Warner, of London:

My invention relates to an improved mode of
treating and purifying iron by causing refining
or purifying agents, such as are hereinafter
mentioned, to operate upon the molten metal in
a receiver in the manner which I will now pro-
ceed to describe, the necessary heat being main-
tained in the molten iron or generated by the
action upon it of the chemical agents employed
without the aid of external heat continuously
applied.

Much difficulty has hitherto been experienced
in treating molten cast iron, with the view of
removing impurities from it by the agency of
infusible materials used for refining, such as
oxides of iron, oxides of manganese, lime, or
limestone and other purifying agents of a like
nature, owing to the fact that when molten
iron is poured into a receiver, in the bottom of
which is deposited the required quantity of the
purifying agents in a mass, the heat of the iron
only acts upon a very thin layer, which cakes
and forms a crust, and prevents the other part
of the agents which are so covered from acting
on the iron, and consequently a sufficient quan-
tity of the purifying agent cannot be actively
employed in connection with the molten iron
so as to have the necessary purifying effect.
Now I have ascertained that by well pulverizing
and mixing with the above mentioned, or simi-
lar infusible, or slowly fusible, or purifying
agents, fusible materials that melt at a com-
paratively low heat, a sufficiently large quantity
of the refining or purifying agents can be
brought into communication with the particles
of the molten iron and so be made to purify or
refine it.

The fusible material, though it may not itself
act with any practical effect in purifying the
iron, is intimately mixed with the infusible or
slowly fusible material, and melts gradually
away, and exposes constantly a fresh surface to
the molten iron instead of baking on its surface
to a hard cake, as does the comparatively in-
fusible purifying agents when used alone. The
fusible materials, which are comparatively
costly, I use in quantities just sufficient to bring
into action the otherwise most slowly fusible
purifying agents; as the latter are cheap, they
can thus be employed in the large quantities or
proportions which I find necessary, and the
operation is not only very efficient, but very
economical.

I am aware that many of the agents which I
propose to employ in treating iron by my
method have been before proposed to be used,
as for instance, in furnaces where extraneous
heat is continuously applied; in some cases,
too, they have been tried in small quantities in
receivers, but they have not been so employed
with practical success, nor have they produced
the beneficial results which I have succeeded in
obtaining.

It will, therefore, be understood that my
present invention does not consist in the em-
ployment of particular purifying agents, but in
the new method of using the known agents for
purifying or refining molten iron in a receiver,
the agents being employed in the necessary
large quantities, and made active by mixing as
required, fusible with infusible, or slowly fusible
materials.

Now the mode in which I treat the molten
iron is as follows: I take ordinary pig iron,
either as it runs from the blast furnace or when
it is remelted in a cupola or other furnace, and
I allow the molten metal to run into a receiver,
which I make of the required shape and dimen-
sions of wrought iron lined with firebrick. At
the bottom of the receiver I place a layer of the
purifying agents, using them in a finely ground
state, and when a mixture of different agents is
used, taking care that they are well ground
together, or otherwise intimately mixed. Of
these agents I employ, as will be found, quan-
tities much larger than it has been hitherto con-
sidered possible to use with advantage. By
employing a receiver made of considerable
depth, and allowing the molten metal to fall
directly upon the surface of the purifying
agents, I find that the metal itself keeps down
the purifying agents below its surface a suf-
ficient time to allow them to act properly without
the assistance of any partition, case, or vessel
to separate the agents from the molten metal.

I also find that while I in all cases employ, as
above mentioned, comparatively large quan-
tities of the purifying agent, these quantities
may be diminished in proportion as I employ
receivers of increased depth to receive the
molten metal, so that the action of the purify-
ing agents as they rise from the bottom of the
receiver up through the metal may have a
longer distance to travel, and so have sufficient
time to exhaust their energies and produce all
the beneficial effect in purifying the iron of
which they are capable. When using the purify-
ing agent in the proportion hereafter men-
tioned, I have employed a receiver of a cylin-
drical shape of about 2 ft. diameter, and suf-
ficiently deep to receive a charge of about two
and a half tons of iron upon the layer of purify-
ing agents, which is previously placed at the
bottom of the receiver. The quantities of the
purifying agents used are as follows: Having
previously ascertained by analysis the composi-
tion of the iron to be treated, I employ for the
removal of every 1 per cent. of silicon from one
ton of iron, 40 lb. of soda ash, 40 lb. of lime-
stone, or thereabouts. These proportions I
have successfully used when acting upon two
and a half tons of molten iron, forming a column
of metal about 3 ft. 6 inches deep. If a deeper
column of metal were employed less materials
would be required, as they are not fully ex-
hausted by passing through 3 1/2 ft. of metal.
If a shorter column were operated upon, more
chemicals would be necessary. The mixture of
soda ash and limestone, above mentioned, I

have found to be sufficient to remove all the
sulphur usually found in ordinary iron

As an illustration of this I found when using
the same quantity of the same purifying agents
to act upon a larger quantity of the same metal
—that it is to say, upon three and a half tons
in the same receiver, I in this case caused the
agents to pass through a column of metal 4 ft.
9 in. deep, and I found that they in this case
purified three and a half tons of metal to about
the same degree as with the lesser depth of
metal—3 ft. 6 in.—they purified two and a half
tons.

When using this mixture of limestone and
soda ash the slag formed is very stiff, and does
not run easily out of the receiver after the
iron. This can be altered by the addition of
another base in the form of a little clay, oxide
of iron, oxide of zinc, fluorspar or other such
material, in order to form a more complex silicate,
as a complex silicate is always more fusible
than a simple silicate. It will be found ad-
vantageous to employ, as being cheap and ef-
fectual, common yellow or any other clay in
the proportion of about one part by weight of
clay to ten parts by weight of the mixture of
limestone and carbonate of soda, and I gener-
ally add an extra one-half part of carbonate of
soda to make sure of this mixture melting by
the heat of the molten metal.

When oxide of iron, oxide of manganese or
fluorspar, or other oxides of the heavy metals
are used, nothing is required, as the slag is al-
ready sufficiently fusible.

When oxide of iron is used the proportions
are two parts by weight of soda ash or there-
abouts, three parts by weight of oxide of iron.
And for acting upon a ton of molten iron,
about 90 lb. of this mixture should be used for
every 1 per cent. of silicon found in the iron.

These proportions are calculated on the sup-
position that hematite iron ore is used for the
oxide; if slags or the more fusible oxides be
used the proportions must necessarily be varied
accordingly, and the quantity of oxide required
must be ascertained by trial, as may be readily
done.

When oxide of manganese is used the pro-
portions are one part by weight of soda ash or
thereabouts, two parts by weight of oxide of
manganese. And for acting upon a ton of
molten iron about 90 lb. of this mixture should
be used for every 1 per cent. of silicon found
in the iron.

When lime is used the proportions are three
parts by weight of soda ash, two parts by
weight of slaked powdery lime. And for act-
ing upon a ton of molten iron, about 85 lb. of
this mixture should be used for every 1 per
cent. of silicon found in the iron.

When it is desired to use fluorspar, which in
general I do not find to be advantageous, it
would be necessary to use about one part by
weight of soda ash and two parts by weight of
fluorspar.

If it is wished to mix any of the ingredients
together—such as, say, limestone and oxide of
manganese, the quantity of carbonate of soda
must be proportioned to the quantity of the re-
spective ingredients in the mixture; for exam-
ple, two parts by weight of limestone, and two
parts by weight of oxide of manganese, would
require three parts of soda ash. Any proportion
can be safely used when the soda ash is in ex-
cess of what I have given, and the quantity of
soda ash may be occasionally reduced when very
hot metal is to be acted upon, or when a small
quantity of purifying agents only is used, or
when a receiver wider at the bottom than at the
top is employed.

I also find that carbonate of soda may be used
alone, and that it successfully removes the sil-
icon, but its employment in the necessary quan-
tities would be found expensive, as from 60 lbs.
to 80 lbs. of carbonate of soda would be re-
quired for each 1 per cent. of silicon found in a
ton of iron, 2 1/2 tons of molten metal being
acted upon in the receiver above referred to.

The quantity of the fusible ingredients may
also be reduced when a decrepitating material,
such as common rock or bay salt, is mixed with
it, and a mixture formed of these decrepitating
salts and non-fusible materials may be em-
ployed when only a small quantity of silicon
has to be removed. The salt will disperse the
powder and cause it to pass up through the
iron when subjected to the heat of the molten
iron, but I do not prefer them, however. For
the sake of cheapness, it may sometimes be de-
sirable to use such substances, as it is evident
that the more the proportion of carbonate of
soda or other fusible salt is reduced the cheaper
will be the mixture.

When employing the purifying agents above
mentioned I use a form of receiver that enables
them to act efficiently. Those hitherto em-
ployed have been straight sided, or if anything,
larger at the top than at the bottom. I find it
more advantageous in some cases to make the
receiver larger at the bottom than at the top,
by means of which I expose a larger surface of
purifying agents to the action of the iron, and
in order that skulls and slag may be easily re-
moved, I make the bottom loose, that is, the
bottom plate upon which the receiver stands is
cottered up to an angle iron flange fixed to the
bottom end of the cylinder, and when required
for work common loam is thrown in and
rammed down, which will make it perfectly
secure.

The receiver may with advantage be mounted
on wheels or connected with a carriage, and
when charged with the purifying agent may be
placed under or in connection with a chimney
and be disconnected when the operation is
complete. Hydraulic machinery may be used
for moving the receiver. Modifications of this
apparatus also may be employed.

Mr. Warner first claims the process of purify-
ing or refining molten iron in a receiver with-
out the aid of heat extraneously applied, by
employing purifying agents such as are herein-
before mentioned substantially in the propor-
tions indicated, and in the manner herein de-
scribed; secondly, he claims for the purpose
of purifying or refining molten cast iron as
hereinbefore described, the employment of
mixed chemical agents consisting of fusible
and infusible materials, in such manner that
the latter are made active by the agency of the
former, the agents being such, and the pro-
portion being substantially such as are herein-
before indicated; thirdly, he also claims for
the purpose of holding comparatively thick
layers of purifying agents and receiving upon
them the charge of molten metal, and so effect-
ing its purification as herein described, the
employment of receivers made wider at the
bottom than at the upper part and with movable
bottoms.

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New Patents.

We take from the records of the Patent Office at Washington the following specifications of certain patents lately issued, which will be found interesting:

IMPROVEMENT IN GAS FURNACES FOR MANUFACTURING IRON AND STEEL.

Specification forming part of Letters Patent No. 155,577, dated October 6, 1874, issued to William S. Gillen, of Pittsburgh.

This invention relates primarily to the economical use of hydrocarbon oil or gas as fuel in metallurgical furnaces. It relates further to means for applying the flame and preventing wasteful escape, and for facilitating the separation and discharge of dross, as hereinafter set forth.

The invention is embodied in a simple puddling furnace of peculiar construction.

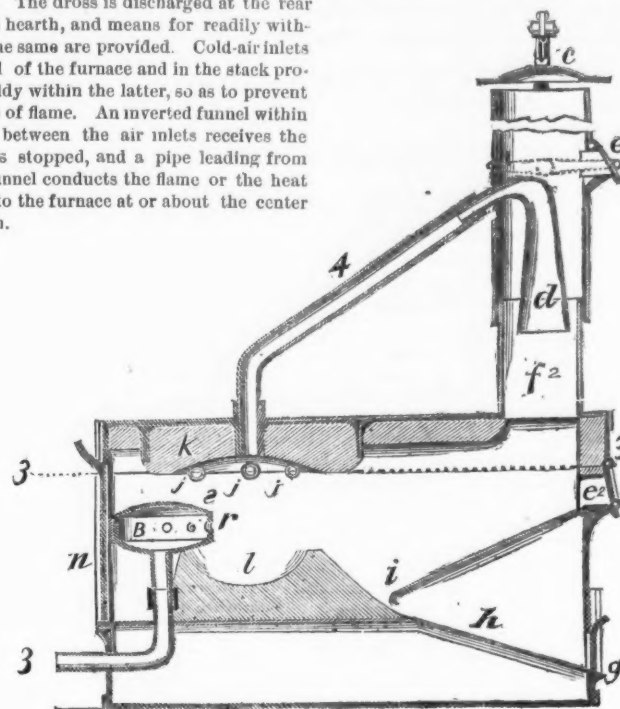
The gas or oil is fed to a burner of peculiar construction, the discharge being regulated by means of a register-slide or valve. The supply of air to support combustion is regulated in a similar manner. The arch of the furnace is longitudinal instead of transverse, and air is admitted beneath the arch through perforated pipes, so as to throw the flame downward upon the metal. The dross is discharged at the rear end of the hearth, and means for readily withdrawing the same are provided. Cold-air inlets in the wall of the furnace and in the stack produce an eddy within the latter, so as to prevent the escape of flame. An inverted funnel within the stack between the air inlets receives the flames thus stopped, and a pipe leading from the said funnel conducts the flame or the heat thereof into the furnace at or about the center of the arch.

the throat of the stack. An eddy is formed in the stack by opening these doors, and the escape of any flame which may enter the stack is thereby prevented. An inverted funnel, *d*, within the stack, below the upper air door *c*, receives the arrested flame. A pipe, *4*, extending from this funnel into the top of the furnace, at or about the center of the arch *k*, conducts the flame or highly heated gases and air from the funnel *d* into the fire space of the furnace, where they are again used. The ordinary damper *c* is applied to the top of the stack to regulate the draft. Doors *b b'* in the side of the furnace give access to the burner and hearth.

The improved burner provides for regulating the discharge of gas or oil with the greatest nicety; also, to spread out the flame horizontally over the surface of metal.

The improved furnace as a whole operates to economize heat and to facilitate the puddling operation.

The following is claimed as new in this invention, namely:

1. As means for burning hydrocarbon gas or oil in a metallurgical furnace, the burner *B* having a large circular head, *a*, with lateral discharge orifices for distributing the gas or oil,

IMPROVED GAS FURNACE FOR IRON AND STEEL.—Fig. 1.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of an improved puddling furnace illustrating this invention. Fig. 2 is a horizontal section on the line 3-3.

The walls and other parts of this furnace not hereinafter specified may be of any common or preferred construction.

Hydrocarbon gas or oil from any source, and treated in such manner as may be necessary or preferred, is conducted by a pipe, *3*, to a burner, *B*, in what is termed the front end of the furnace. The burner *B* is constructed with a large circular head, *a*, having cylindrical walls, which are perforated for the escape of the gas or oil, the same being so arranged as to properly distribute the flame. A register slide or valve, *r*, perforated correspondingly with the burner proper, regulates the discharge of gas or oil, and is operated by means of a handle rod, *q*, extending out through the front of the furnace, and attached to an arm, *p*, of the valve. A lug, *o*, prevents any displacement of the valve. The front of the furnace is provided with a grating, *n*, for the admission of air to support combustion. A slide, *m*, covers more or less of this grating, as required to regulate the admission of air.and a circumferential register slide or valve, *r*, for regulating the discharge, as set forth.2. The combination, in a puddling furnace, of a grating or perforated front wall, *n*, furnished with a slide, *m*, for regulating the entrance of air, and the burner *B* supplied with heated gas or oil, arranged with reference to the hearth, as herein shown and described, for the purposes set forth.3. A puddling furnace provided with two air inlets, *e e'*, arranged, respectively, in the stack and rear wall, an inverted funnel, *d*, arranged in the furnace stack between said air inlets, and a pipe, *4*, leading from said funnel through the side of the stack and into the top of the furnace at or near the center of the arch, the same being combined substantially as herein shown and described, to operate in the manner set forth for arresting the flame within the stack and conducting the unconsumed gases back into the furnace.**The Lake Survey Nearly Completed.**

The present season's work of the United States Lake Survey is nearly completed. The

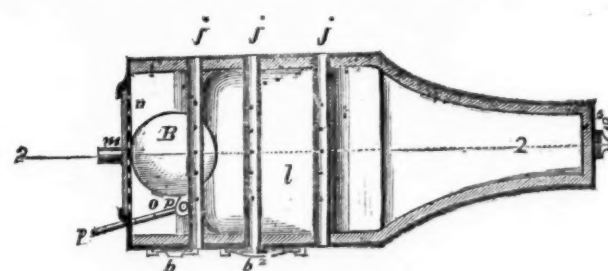


Fig. 2.

work of triangulation has been carried from the mouth of the St. Lawrence River to Oswego, and the accompanying shore line work nearly as far, beside offshore soundings. The survey has also been at work on the triangulation around the southern end of Lake Michigan, from St. Joseph to Michigan City, which will complete the link on this Lake also. With the completion of the little link on Lake Michigan and the west half of Lake Ontario, the entire survey of the Lakes will have been accomplished. The value and importance of this work to the vessel and other commercial interests of the country can hardly be over estimated. Thirty-nine charts have already been published, which have times without number proved of inestimable service to navigators on the great lakes and their connecting straits. Every vessel is supplied with these charts, and with a proper study of them every sailing master on the lakes may possess himself of exactly such information as he most needs. The survey of Lake Erie was made many years ago, and the charts then furnished are still in use; but as the survey was not so minute in detail as is now considered desirable, if not almost indispensable, it is probable that a re-survey of that lake will be ordered within a year or two.

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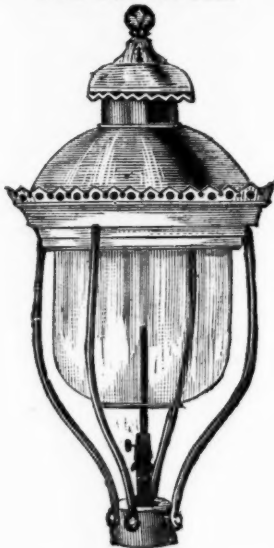
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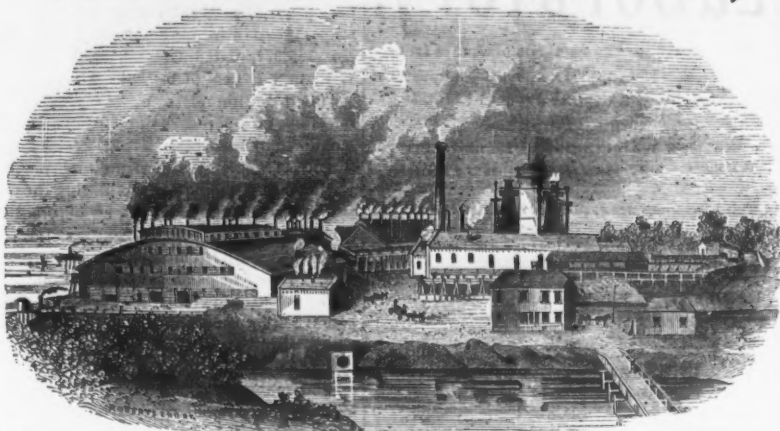
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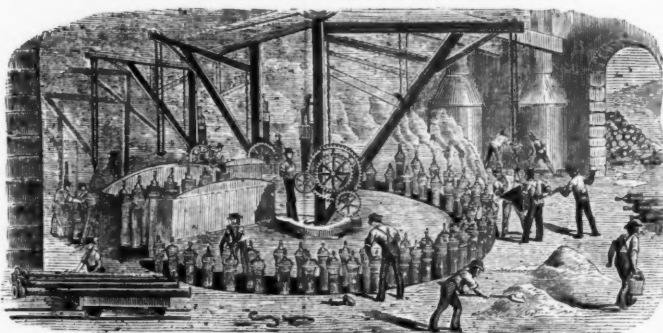
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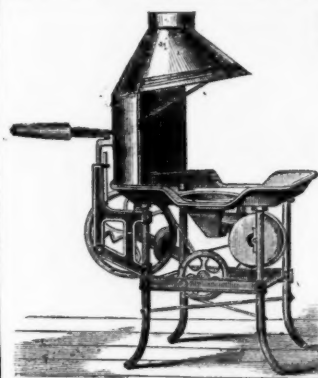
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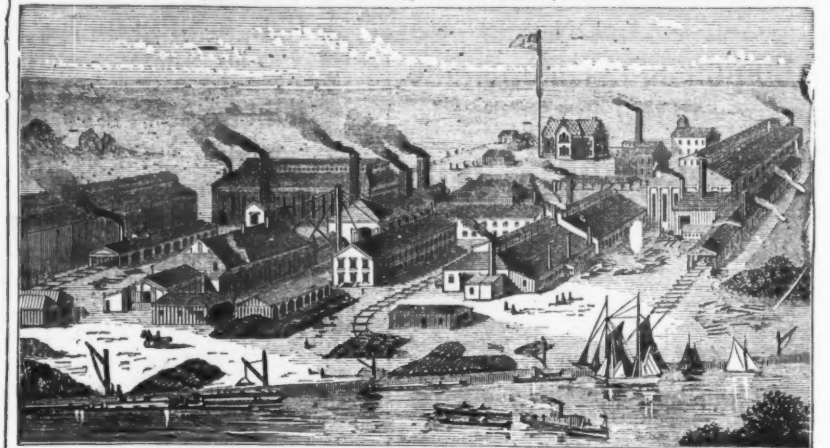
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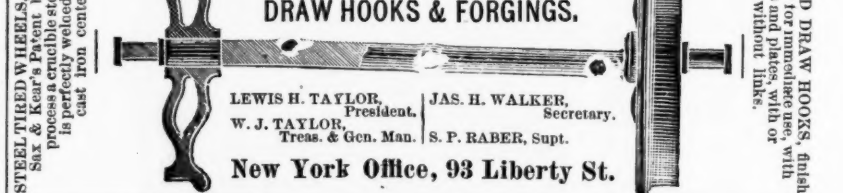
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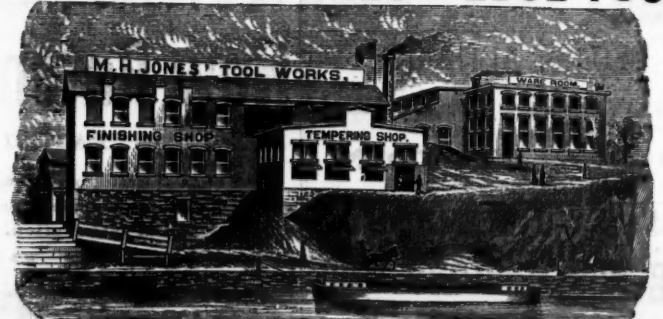
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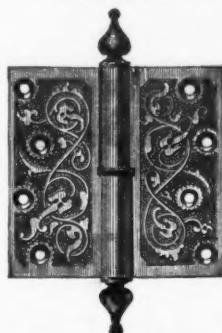
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Toilet Irons, Towel Racks, &c.**The Deposition of Metals.**

The following items relative to the deposition of various metals upon the surfaces of other metals, are compiled from Byrne's Practical Metal Worker's Assistant. They will be found of interest and value to our readers, as answering many questions which are almost daily asked us by correspondents in various parts of the country.

COATING WITH NICKEL.

Nickel is very easily deposited, and may be prepared for this purpose by dissolving it in nitric acid, then adding cyanide of potassium to precipitate the metal; after which the precipitate is washed and dissolved by the addition of more cyanide of potassium. Or the nitrate solution may be precipitated by carbonate of potash; this should be well washed, and then dissolved in cyanide of potassium; a portion of carbonate of potash will be in the solution, which we have not found to be detrimental. This latter method of preparing the nickel plating solution is simple, and, therefore, has our recommendation. The metal is very easily deposited, it yields a color approaching to silver, which is not liable to tarnish on exposure to the air. A coating of this metal would be very useful for covering common work, such as gasaliers, and other gas fittings, and even common plate. The great difficulty experienced is to obtain a positive electrode; the metal is very difficult to fuse, and so brittle that we have never been able to obtain either a plate or a sheet of it. Could this difficulty be easily overcome, the application of nickel to the coating of other metals would be extensive, and the property of not being liable to tarnish would make it eminently useful for all general purposes. We coated articles with nickel in 1845, which were exposed to the air for many years without tarnish, and when last seen by the author exhibited no change.

ANTIMONY, ARSENIC, TIN, IRON, LEAD, BISMUTH AND CADMIUM.

We have deposited these metals from their solutions in cyanide of potassium; but not for any useful application.

IRON.

Iron may be very easily deposited from its sulphate: Dissolve a little crystalline sulphate of iron in water, and add a few drops of sulphuric acid to the solution. One pair of Smee's battery may be used to deposit the iron upon copper or brass. The metal in this pure state has a very bright and beautiful silver color.

LEAD.

Lead may be deposited from a solution of an acid salt, such as the acetate, but requires some management or strength of battery; it may also be deposited from its solution in potash or soda.

ALUMINIUM AND SILICIUM.

Since the publication of the former edition of this work, new methods have been discovered for obtaining the base or metal of alumina and silica, or clay and sand, in the metallic state, possessing extraordinary properties. One of the methods successfully adopted, is by fusing in a small crucible some chloride or fluoride of aluminium, and when in fusion, inserting two steel poles in connection with a battery which reduces the salt, giving small globules of the metal aluminium. Attempts have also been made to deposit the metals from their cyanous solution, as coating upon other metals in the usual way. We have not ourselves tried any experiments upon these metals, but we take the following results of experiments from Mr. G. Gore, of Birmingham, who seems to have given the subject a good deal of attention:

"It has long been known to chemists that all kinds of clay, stone and sand, of which the earth is composed, consist of metals combined with oxygen, carbonic acid, sulphuric acid, and other non-metallic elements, forming therewith oxides, carbonates, sulphates, etc.; thus clay is an oxide of aluminium, sand an oxide of silicium, limestone a carbonate of calcium; but the separation of the metallic bases from the non-metallic elements with which they are combined has been a matter of so great difficulty that few chemists have put themselves to the trouble of accomplishing it, and those who have done so have made use of the most powerful means and reducing agents, such as large voltaic batteries, potassium, etc., and have then obtained them in a state of alloy or combination with mercury. Sir Humphrey Davy, the discoverer of most of these bases, in his experiments on the decomposition of the alkalies and earths, used a powerful battery, consisting of 500 pairs of plates, and then succeeded in obtaining them combined with mercury, from which they were afterward separated. Wohler and Berzelius, in their discoveries of the means of separating the metals aluminium and silicium from their respective compounds, clay and sand, used a high temperature and potassium, and then succeeded in obtaining them in the condition of dull metallic powders, nearly infusible.

"By a means recently discovered, and described in the March number of the *Philosophical Magazine* for this year, I have succeeded in depositing the metals aluminium from clay, and silicium from sandstone, each in a perfect metallic condition, by dissolving pipe clay, common red sand, pounded stone, etc., in various chemical liquids, and passing currents of electricity from ordinary small voltaic batteries through the solutions.

"My attention has since been directed to produce simple processes, whereby any person not possessing a knowledge of chemistry may readily coat articles with these metals, and thus cause the discovery to be immediately applied to human benefit in the arts and manufactures, and the following are the results of my experiments:

"To coat articles of copper, brass or German silver with aluminium, take equal measures of sulphuric acid and water; or take one measure

each of sulphuric and hydrochloric acids and two measures of water; add to the water a small quantity of pipe clay in the proportion of 5 or 10 grains by weight to every ounce by measure of water (or $\frac{1}{2}$ ounce to the pint); rub the clay with the water until the two are perfectly mixed, then add the acid to the clay solution, and boil the mixture in a covered glass vessel one hour. Allow the liquid to settle; take the clear, supernatant solution while hot and immerse in it an earthen porous cell, containing a mixture of one measure of sulphuric acid and ten measures of water, together with a rod or plate of amalgamated zinc; take a small Smee's battery, of three or four pairs of plates, connected together intensively fashion, and connect its positive pole by a wire, with the negative pole of the battery, and immerse it in the hot clay solution; immediately abundance of gas will be evolved from the whole of the immersed surface of the article, and in a few minutes, if the size of the article is adapted to the quantity of the current of electricity passing through it, a fine white deposit of aluminium will appear all over the surface. It may then be taken out, washed quickly in clean water and wiped dry and polished; but if a thicker coating is required it must be taken out, when the deposit becomes dull in appearance, washed, dried, polished and reimmersed; and this must be repeated at intervals, as often as it becomes dull, until the required thickness is obtained. With small articles it is not absolutely necessary, either in this or the following process, that a separate battery be employed, as the article to be coated may be connected by a wire with a piece of zinc in the porous cell, and immersed in the outer liquid, when it will receive a deposit, but more slowly than when a battery is employed.

"To coat articles with silicium take the following proportions: three-quarters of an ounce, by measure, of hydrofluoric acid; $\frac{1}{2}$ ounce of hydrochloric acid; and 40 or 50 grains, either of precipitated silica, or of fine white sand (the former dissolves most freely), and boil the whole together for a few minutes, until no more silica is dissolved. Use this solution exactly in the same manner as the clay solution, and a fine white deposit of metallic silicium will be obtained, provided that the size of the article is adapted to the quantity of the electric current common red sand, or, indeed, any kind of silicious stone, finely powdered, may be used in place of the white sand, and with equal success, if it be previously boiled in hydrochloric acid to remove the red oxide of iron or other impurities.

"Both in depositing aluminium and silicium it is necessary to well saturate the acid with the solid ingredients by boiling, otherwise very little deposit of metal will be obtained."

TIN.

Tin is easily deposited from a solution of protochloride of tin. If the two poles or electrodes be kept about two inches apart, a most beautiful phenomenon may be observed. The decomposition of the solution is so rapid that it shoots out from the negative electrode like tentacula or feelers, toward the positive, which it reaches in a few seconds. The space between the poles seems like a mass of crystallized threads, and the electric current passes through them without effecting further decomposition. So tender are these metallic threads that when lifted out of the solution they fall upon the plate like cobweb. Seen through a glass they exhibit a beautiful crystalline structure. If a circular electrode of tin is used, and a small wire put in the center of the chloride solution, the thread-like crystals will shoot out all round, and give quite a metallic conserve. Tin may also be deposited from its solution in caustic potash or soda.

ANTIMONY.

In the deposition of antimony, Mr. Gore has observed a curious and interesting phenomenon that the metal during its deposition, and after some has been deposited, explodes occasionally, the particles being thrown about by the shock.

(To be Continued.)

Planing of Metals.

A French physicist, M. Tresca, has recently been engaged in an interesting research on this subject. He gives an account of it in a memoir which has appeared in the *Bulletin de la Société D'Encouragement*. At the close of the paper he formulates his conclusions, which are these:

1. The operation of planing produces, in the prism of matter cut by the tool, characteristic pressures and deformations, which vary according to the form of the tool and the thickness of the prism removed.
2. These circumstances are more easy to define where the case is that of a planing done over the whole breadth of a solid by means of a tool with straight edge, and cutting surface, plane or cylindrical, in which the generating lines are perpendicular to the direction of the movement, and parallel to the surface of the solid planed. With these conditions the shaving detached is a transformation of the original prism, produced by diminution of length, in consequence of a transverse flowing (*écoulement*) of matter in the direction of the thickness of the shaving, under pressure of the tool.
3. The co-efficient of longitudinal contraction depends on the degree of sharpness of the tool, the facilities it offers for disengagement of the shaving, but, above all, the thickness of the shaving removed. The co-efficient of reduction is smaller for thin shavings, because the flowing in the transverse direction is then rendered easier.
4. The co-efficient of dilatation in the thickness is inversely as the co-efficient of reduction in the length.
5. The co-efficient of reduction varied in the whole series of experiments made, from 0.10 to 0.60, and we possess shavings of steel of more

than a millimetre in thickness, for which it does not exceed 0.25.

6. The surface of separation between the shaving and the block is always smooth, and is modeled on the cutting face of the tool. The opposite face is always striated, and presents the appearance of a series of parallel waves, which are more salient the thicker the shaving. These waves continue to the edge, where we find indications of a flow in width, limited to a very small extent, commencing at these edges. In fine cuttings the striae, which are much finer, impart a velvety appearance to the whole surface.

7. A circumference traced on the exterior face before planing, is transformed into an ellipse, in which the relation of the two axes affords the measure of the co-efficient of reduction; but it is best to obtain it by operating with great lengths.

8. When the deformations exceed certain limits the shaving is split at intervals, and there is a disjunction in the directions in which lie the furrows of the waves.

9. When the tool is blunted, the co-efficient of reduction diminishes, and the planing becomes more difficult.

10. The cylindrical form of the tool is very favorable to the operation, and an examination of the deformations leads us to the conclusion that the hyperbolic form is the most recommendable.

11. In virtue of the pressure exerted by the cutting face of the tool on that of the shaving, the latter emerges perpendicularly to the surface of the solid, thereupon turning round. Thin shavings become rolled up in the form of a cylinder with spiral base, the windings exactly covering each other. The radius of rolling increases with the thickness.

12. When the generating lines of the cylinder which forms the side of the cutting face of the tool are inclined relatively to the plane of motion, the shaving instead of being rolled up cylindrically, takes the form of the exterior surface of a screw with square thread.

13. The lateral attachment of a conical shaving by one or other of its edges has no sensible influence on the result of the planing. The co-efficient of reduction remains the same, but the edges originally engaged are less round, and are even cut sharply in one part of the thickness of the shaving.

14. When the dimension in thickness becomes comparable to the dimension in width, there is dilatation in both directions, and the shaving takes a quite particular form, of triangular section, which is readily deduced from certain geometrical considerations.

15. The employment of a tool with curved edge gives rise to similar transformations, which are explained in the same way.

16. From the geometrical point of view the formation of shavings may be represented in all its phases by geometrical traces, according to perfectly sure rules. In a first phase, that of driving back (*refoulement*) the matter not yet detached from the block, acquires, in each of its longitudinal sections, its definitive dimensions in thickness and width. In a second phase, that of flowing, the shaving slides on the face of the tool, and acquires its definitive section. In a last phase the shaving escapes, turning round, according as the co-efficients of reduction imposed on its different longitudinal sections, exert on them an influence more or less preponderate.

17. With the rectangular tool, having equal angles, a shaving of square section is liberated in the bisector plane of the dihedral figure formed by the two faces removed, giving rise to a deformation more complex, but quite as plausible as that of ordinary shavings.

18. With the tool having a curved edge the effects are of the same order, and bring to light the mode of driving back of a solid brought to the state of fluidity under the action of the exterior pressures to which it is subjected on one of its faces. The gorge-curve, which is produced at the limit of the two first phases of the formation, is quite characteristic, and leaves its impress on the originally free face of the shaving, under the form of curved furrows, which are reproduced identically the same throughout the whole length.

19. In the shavings, the breadth is approximately determined by the chord which joins the extremities of the crescent detached at each passage of the edge.

20. The convexity of the shaving appears generally at the thicker border, and there is no exception to this, save in cases where the relative sharpness of the tool exerts on the thin parts an influence strong enough to compensate that of the more favorable co-efficient of reduction corresponding to the thicker border.

21. The more complex kinds of planing, such as work with the lathe, on circumference or extremity, do not introduce any notable change into these conclusions; which are thus quite general.

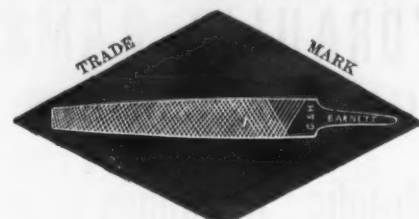
22. The work necessary to produce planing is composed of a work of cutting and a work of deformation, represented each by rational formulae.

23. These formulae show the advantage of the thick passages (*passes*) which mark the present tendency in the industry of machine tools.

24. The pressure exerted by the tool is transmitted from transverse section to transverse section up to the limit of the zone of activity, according to a logarithmic law deduced from these formulae.

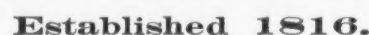
25. Lastly, and it is the ruling character of this work, the hardest, as the softest, metals are subjected in all these deformations to common laws, which establish for all the matter experimented with an identity hardly suspected, hitherto, in their mechanical properties, even beyond their limit of elasticity.

26. The preceding effects are perhaps not without interest for the theory of the plough, which one may consider as a planing tool acting under special conditions.



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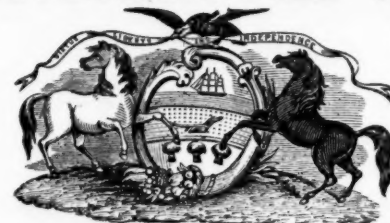
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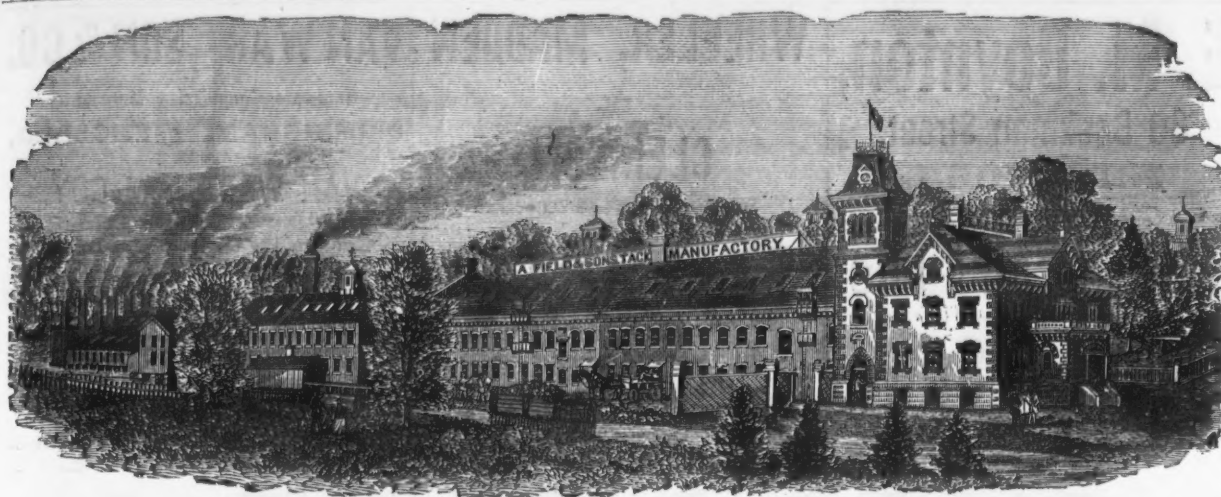
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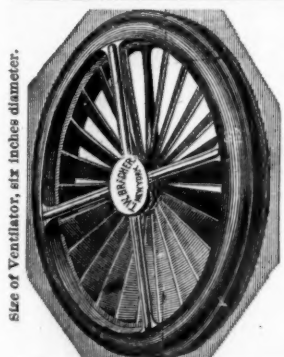


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BUSINESS ITEMS.

NEW YORK.

The Elmira Rolling Mills have secured a con-
tract for rails for the Chippewa Falls and Wes-
tern Railroad.

NEW JERSEY.

The Wilson Iron Company, of Morris county,
just organized, have taken possession of the
Splitrock Forge property, and will immediately
commence the erection of a furnace known as
the "Wilson Patent" for the manufacture of
iron in blooms. It is the purpose of the com-
pany to also enter upon the manufacture of a
different article of iron next spring, if a suit-
able location can be had in the vicinity of Dover
or Rockaway.

The Crane Iron Company has decided to run
Jenny Jump and Kishpaugh mines all winter
with a full force of hands, but the wages will
not be paid until April. The necessities of
life are provided from the company's stores on
orders.

The factory, machinery, &c., of the former
United States Watch Company, of Marion,
which has been in bankruptcy, has passed into
the hands of the Marion Watch Company, the
old organization under a new name. It is said
that the works will be immediately put in op-
eration with about 300 employees.

Two hundred men have been discharged
from the different shops of Messrs. Starr &
Sons Iron Works, in Camden. The works em-
ploy 1000 hands when running full force, and
there is not over 500 now in the shops.

The Rogers Locomotive Works, Paterson,
are engaged in the construction of eight new
locomotives for the Hackensack branch of the
Erie Railway.

PENNSYLVANIA.

A corporation, composed of influential man-
ufacturers of railway cars of Pennsylvania, has
been formed in Philadelphia, for the purpose of
constructing cars and leasing them to railroad
companies at a rental which, after paying an
interest of 8 per cent. upon the cost of the cars,
will leave a surplus applicable to the payment
of such cost, and by this process the railroad
companies leasing gradually become the owners,
of the cars. The principal support will probably
be derived from the Pennsylvania Railroad
Company. The name of the association is the
"Railway Equipment Trust Company, of Penn-
sylvania." The capital has been fixed at
\$3,000,000, and contracts have been given for
the construction of one thousand cars at \$600
per car.

Porter, Bell & Co., recently shipped one of
their narrow gauge locomotives to the Peach
Bottom Railroad, York. One in Ecuador,
South America, runs 35 miles an hour with
heavy load on unballasted track. Porter, Bell &
Co.'s narrow gauge freight engines are at work
on grades of three hundred feet per mile, pass
around curves of one hundred feet radius, and
have a speed of over thirty miles per hour.

The Union Forge and Iron Mill, at Pitts-
burgh, formerly known as the Lower Union
Iron Mill, and which has been operated during
the past year under the firm-name of Wilson,
Leggett & Co., is now running very success-
fully under the new firm-name of Wilson, Walker &
Co., the change having been made on the first
of October. These works are engaged chiefly
in the manufacture of railroad specialties, of
which they are shipping regularly sixty tons
per month to one railroad company, and have
contracted within the past month to supply
several other roads, which orders they are now
filling. They are also manufacturing iron by a
new process, a large portion of which is used
by Messrs. Kroman, Park & Co. in the manu-
facture of axles, and by Messrs. Alborn &
Eckermann for axles.

The Lehigh Iron Company have reduced the
pay of their hired officers and clerks an average
of 25 per cent.

The Reading Eagle claims to have reliable
authority for the statement that the entire
working force of the Reading Railroad Com-
pany's shops in that city will shortly resume
work on full time.

Hussey, Wells & Co., Pittsburgh, are putting
in a new sheet train and three heating furnaces,
room for them having been made by the aban-
donment of three melting holes, consequent
upon the erection of the Siemens furnaces in
the new addition to their building.

All the iron works of Danville are now in
operation, for the first time in 18 months.

The forge department of the New Castle Iron
Works has been idle for two weeks. When it
resumes it will take the name of the Etna Iron
and Nail Company.

The machinery of the Co-operative Iron and
Steel Company's new rail mill, at Danville, was
put in operation a short time ago, and it worked
admirably.

Eight hours a day for five days, and no work
on Saturday, now constitutes a week's work at
the shops of the Pennsylvania Railroad Com-
pany, in Harrisburg.

Several new heating furnaces of improved
patterns are being erected at the Agricultural
Steel Works of A. J. Nellis & Co., Pittsburgh.
This improvement will materially increase the
capacity of that department of the works in
which the process of tempering is carried on.

The Onondaga and the Etna Iron Works, at
New Castle, owned and run by a joint stock
company, will probably continue operations
throughout the entire winter without cessation.
The Onondaga mill is now being repaired, and
will soon be completed.

The second furnace of the Cambria Iron
Company, at Hollidaysburg, will soon be blown
in.

The locomotive works of Porter, Bell & Co.,
at Pittsburgh, are running four days in the
week.

OHIO.

Warder, Mitchell & Co., of Springfield, man-
ufacturers of the Champion Mower and Reaper,
have been making extensive additions to their

works, and are preparing to erect more build-
ings at once.

The Marietta Rolling Mill has an order for 200
car loads of railroad iron.

The Grafton Iron Company is running full
force and making No. 1 foundry.

A hollow tooth harrow company, with \$10,000
capital, has been formed at Chillicothe.

The Cherry Valley Iron Company, Leetonia,
have just finished the repairs on their No. 1
Furnace, and are now at work on new hot
blasts. No. 2 is making an extra quality of
iron from native ore. Considerable confidence
is placed in a report that at a meeting of the
directors, about four weeks ago, they decided
to start the remaining furnace and the rolling
mill. The repairs on both are nearly com-
pleted; and, no doubt, the report has good
foundation. This would give employment to
200 men.

The blast furnace and rolling mills of Wm.
Richards & Son, Youngstown, are going in full
force.

The manufactured product of Ballard, Fast
& Co., of Canton, manufacturers of knives,
springs and saws, amounts to about \$1200 per
day.

The Champion Works, at Springfield, promise
a production of 12,000 mowers and reapers next
season.

MASSACHUSETTS.

The New York and New England Railroad
Company have erected their repair shops of
Norwood, and they will soon be ready for occu-
pancy. The shops consist of two brick build-
ings, one story, monitor roof, 374 feet long and
70 feet wide, and 200 feet long by 70 feet wide,
respectively, and are located on the line of the
road near the Everett station. The town of
Norwood, understanding that the railroad com-
pany was favorably disposed to the purchase of
fourteen acres of land, but did not wish to pay
more than \$200 per acre, voted to raise the
difference in price between what the owner
valued the land and at what the company was
willing to pay, hence the result. In the paint
and blacksmiths' shops are placed two iron
water tanks the entire length of the building,
to be used in case of fire, or for the use of the
employees, while a concrete floor is laid in the
paint shop. An engine house forms a wing,
in which is placed a 130 horse-power double
engine. A chimney 75 feet high carries off the
smoke. It is estimated that there are over six-
teen tons of iron used in the construction of
the building, and the roofs are supported by
heavy trusses.

All the hands in the Lowell Machine Shop are
insured employment through the winter by the
acceptance of contracts for the manufacture of
\$270,000 worth of machinery.

Notwithstanding the general depression
which has marked almost every department of
domestic industry during the past six months,
the demand for horse nails has not suffered,
judging from the following: The Globe Nail
Company, of Boston, during the period above
mentioned, have run their works on full time,
their books from June to November showing a
deficiency of goods to fill orders on hand
amounting to from 30 to 80 tons.

CONNECTICUT.

Business is livelier than ever, in many re-
spects, at Meriden. The Britannia Company
have one hundred men more than ever before.
Machinery is being manufactured at Colt's
Armory, at Hartford, for a new screw factory
to be located at Berlin.

The American Pin Company, at Waterbury,
occupy extensive quarters for the manufacture
of pins. Their main building is 100x40 feet,
four stories high, and built of brick. They have
another building 120x30 feet, and two stories
high. The works at present give employment
to sixty hands, but during the busy season
double that number are employed. There are
75 machines, each machine being capable of
turning out 175 pins per minute. The works
have a capacity for consuming 20 tons of wire
each week, and turning out 94,500,000 pins.
The company was organized in 1850, and has a
capital of \$300,000.

The knife works at Lakeville are doing a good
business, and keeping a full force of men em-
ployed.

RHODE ISLAND.

The American Twist Drill Company, of
Woonsocket, have recently received an order
for \$1500 worth of their machines from Shang-
hai, China. Also an order to the amount of
\$300 from England.

Mr. Charles Bayliss, of Pittsburgh, has in-
vented an apparatus which he has named the
"Siberian Combined Furnace," which is thus
described: It is called a combined furnace, be-
cause it contains melting, fining and puddling
chambers, substantially, in one apparatus, all
heated from the same source of heat. It has no
grate, but a blast device, and can be worked
with either solid, liquid or gaseous fuel. The
mode of operation is to charge the hearth with
coal and turn on the blast; the melting part
gets hot in a very short time, the iron is then
charged. When all is melted it is tapped and
run into the fining chamber, another heat is
charged and melted in the same way. When
the iron is sufficiently fined, it is run into the
third chamber, and puddled and drawn in the
usual way. The furnace is capable of produc-
ing 50 tons per week, and its advantages may
be briefly stated thus: It saves coal, because
having no grate it makes no ashes, and the
waste heat, escaping from the melting of one
charge is utilized in puddling another, so that
the two operations go on simultaneously. An-
other source of economy in fuel is the intense
heat generated by the combustion of the graph-
ite in the iron when being fined by the air. It
saves fixing, because fined metal does not scour,
and furnaces in which it is worked do not re-
quire fixing. It reduces the labor of the pud-
dler, as he will not have to fire, charge, melt,
clean the grate nor fix his furnace.

GEORGE GUEUTAL & SON,
39 West 4th St., New York.
IMPORTER OF
**Wood Screws, Steel in Sheets,
BAND SAWS, TOOLS FOR BRAZING, &c.
Bed Screws, Pin Hinges, and Wire Nails a Specialty.**

H. W. PEACE,
MANUFACTURER OF
SAWS OF ALL KINDS.
FACTORY, WILLIAMSBURGH, N. Y.

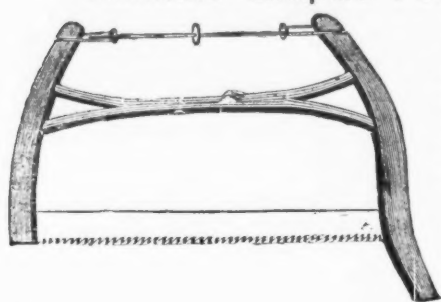
**THE SILVER STEEL
DIAMOND CROSS-CUT SAW.**

\$1.50 Per Foot. Patent Secured

THIS new Saw, which is destined to take the place of all Cross-cut Saws in point of **SPEED AND EASE**, is manufactured by **E. C. ATKINS & CO., Indianapolis, Ind.**, who are the **SOLE MANUFACTURERS FOR THE UNITED STATES.** So confident are we that this is the best Cross-cut Saw in the market that we **CHALLENGE THE WORLD.** Orders promptly filled.
E. C. ATKINS & CO.
Saw Manufacturers and Repairers, Indianapolis, Ind.

Hankins' Elliptic Forked Saw Frame.

Patented June 28th, 1870.



The annexed engraving represents **HANKINS' ELLIPTIC FORKED SAW FRAME**, which commends itself to the trade for its simplicity of construction. The Forked Frame being all in one piece, without any center bolt, secures for the frame great strength and durability. These Frames are put up with my best Webbs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,
VULCAN SAW WORKS.
WILLIAMSBURGH, N. Y.

J. FLINT & CO.
Manufacturers of all kinds of **SAWS and PLASTERING TROWELS.**
ROCHESTER, N. Y.

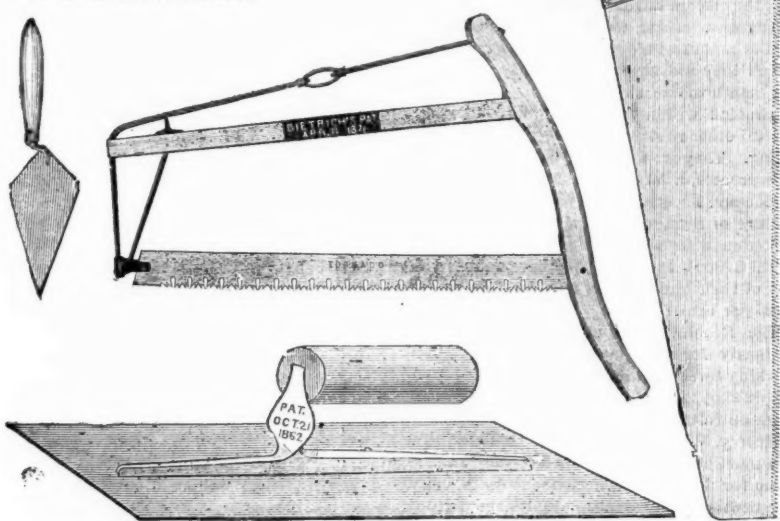
Dietrich's Patent Wood Saw. Guaranteed the strongest, lightest, easiest to strain or tighten and best braced wood saw made; also to give perfect satisfaction.

Dietrich's Patent Double Handle Rip Saw. All will readily see the benefit of this useful invention.

J. Flint's Patent Plastering Trowels. The best made and finished Trowels in the world. We make four grades of Plastering Trowels, from the best to the cheapest.

Our patent method of grinding hand saws makes them superior to any in the market.

Send for Illustrated Price List.



Lloyd, Supplee & Walton,
HARDWARE FACTORS.

MANUFACTURERS OF

**Bonnev's Hollow
AUGERS.**

Stearn's Hollow Augers

and Saw Vises:

Bonnev's Spoke Trimmers

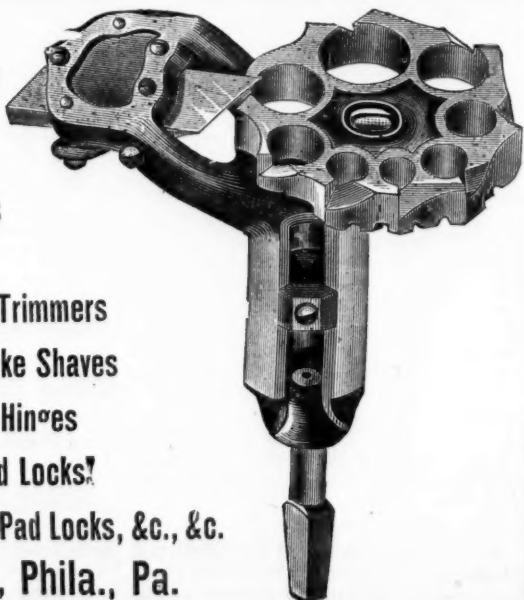
Double Edge Spoke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks?

Flat Ke- Brass and Iron Pad Locks, &c., &c.

625 Market St., Phila., Pa.



E. M. Boynton,
80 Beekman Street,
NEW YORK,
Manufacturer of

**Saws of all kinds.
LIGHTNING SAWS.**

Two Direct Cutting Edges, instead of one Scraping point.



Note extra steel and durability over the old V, out-lined on M tooth.

I am willing and extremely anxious, on proper notice, to accept a Challenge from H. Disston & Sons, or any responsible Saw Manufacturer, and am ready to back my words with appropriate deeds and \$500 expense, if beaten.

N. B.—With Hand, Billet or Cross Cut Saw, \$500 on each.
E. M. BOYNTON.

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SAMUEL A. GODDARD & CO.,**
Commission Merchants and General Agents
execute orders for British manufactures on the lowest terms, and collect and forward goods for a very moderate payment. Agents for the sale of North Staffordshire Iron of a standard quality.

RIEHL BROTHERS,
Ninth Street, near Coates, Philadelphia.
New York Store, 93 Liberty Street.
Pittsburgh Store, 255 Liberty Street.



"Patented" Furnace Charging Scale.
Double Beam, R. R. Track Scale, Compound Parallel Crane Scales, &c. Patented First Power Lever Wagon Scales. Testing Machines any capacity.

**PYROMETERS
for BLAST FURNACES.**

**E. BROWN'S STANDARD PORTABLE,
E. Brown's Improved
Gauntlet**



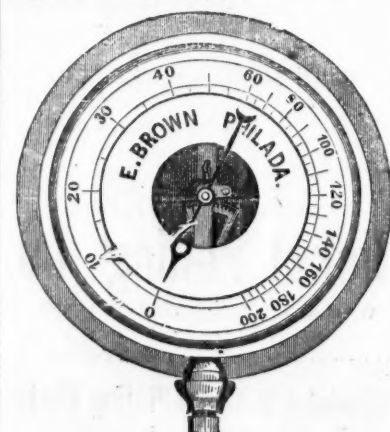
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PYROMETERS

For Baker's Ovens, Boiler Flues, Galvanizing Baths, Oil Stills, Vulcanizers, Superheated Steam.

E. Brown's Portable Blast Gauge for the plug hole, Steam Gauges, Blast Gauges, Mercury Gauges, Recording Steam Gauges, Engine Counters, Indicators for ascertaining the Horse Power.



Over 300 "Gauntlett" and 100 Portable Pyrometers are now in use at Blast Furnaces.
Circulars on application.

**WHEELER, MADDEN
&
CLEMSON,**
Manufacturers of Warranted Cast Steel

SAWS

of every description,
including

Circular, Shingle, Cross Cut,
Mill, Hand, Roberts' and
other Wood Saws,
&c., &c

Cast Steel Files

of the well known brand of

Wheeler, Madden & Clemson.

FACTORIES:

Middletown, Orange Co., N. Y.

BRANCH OFFICE:

97 Chambers Street, New York.

BRUNDAGE FORGED HORSE NAILS,

Manufactured from

BEST NORWAY IRON,

by **BRUNDAGE & CO.** Sold by

WHEELER, MADDEN & CLEMSON
Middletown, Orange Co., N. Y.



I make a specialty of the **LARGEST SIZES** of Circular Saws, and call particular attention of lumber manufacturers to the following points of excellence: **Evenness of Temper.**—The peculiar structure of my furnace subjects all parts of the saw to a **DEAD** heat, and when dipped in the oil bath secures perfect uniformity.

Perfect Accuracy in Thickness.—My saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed **BALANCES PERFECTLY**, which is proof positive of the right accomplishment of the work.

Properly Hammered.—Great care is taken that no saw shall leave my works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, cannot be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time **RUN TRUE.** This department is under the personal supervision of myself, who has devoted over *twenty years* to the art of saw making.

I am sole proprietor and manufacturer of the celebrated "**Ohlen's**" Cross-Cut Saw. Price Lists of all kinds of saws sent on application.

JAMES OHLEN.

The Sugar Maker's Friend.
More agents wanted to canvass for the sale of **Ohlen's** Patent Galvanized Metallic Furka Saw Spout and Bucket Hanger. Samples, Circulars and Terms sent on receipt of 20cts to pay postage. Address, **C. C. Post, Manufacturer & Patentee, Burlington, Vt.**

Backus's Patent Bit Brace

AND

**Angular Extension
BORER.**

Q. S. Backus,

SOLE MANUFACTURER OF

ANGULAR EXTENSION BORER.

Salesroom, 82 Chambers St., N. Y.

This tool can be used in any brace, at any angle, and also for straight work. Is the best and most convenient tool of its kind ever offered to the public. Eight thousand sold the first year.

Also Manufactures the Straight Extension

Backus's Pat. Improved Bit Brace.



The socket is arranged so that the strain does not come on the jaws, but on the square hole which fits the shank of the bit. The jaws attached to the sleeve hold the bit firmly in the square, and center it truly. The sweep is of wrought iron. The general finish of the stock is good. Its appearance is to all others; and we offer it to the trade as the strongest, most simple, and quickest operating brace in the market. We manufacture five sizes. The number of inches of sweep corresponds with the commercial number of the list.

VAN WART, SON & CO.

Hardware Commission Merchants,
BIRMINGHAM, - ENGLAND,
Agents,

VAN WART & McCOY,

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At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for **John Rimmer & Son's Celebrated Harness and other Needles.**

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FORWARDING AGENTS,
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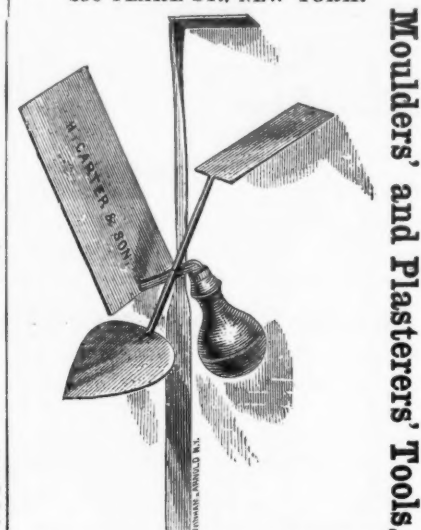
New York—Edward Frith, 16 Cliff Street.

Boston—H. L. Richards, 18 Battery March, Street.

New Orleans—R. Rhodes, 71 Camp Street.

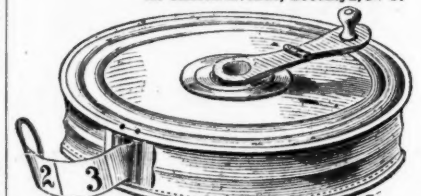
Montreal—J. J. Evans 14 St., John Street.

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290 PEAILL ST., NEW YORK.



Manufacturers of and Dealers in all descriptions of Moulders' and Plasterers' Tools, and Dealers in General Hardware, Gilded Copper Weather Vanes, **CARTERS' PATENT CARRIAGE LIFTING JACK, &c**

GEO. M. EDDY & CO.,
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Manufacturers of Paine's Patent Steel Standard Measuring Tapes, for Surveyors, Engineers and Mechanics requiring a correct measure of great length according to U. S. Standard. Also of Tape measures for the same trades, Lumbermen, Machinists, Tailors, Shoemakers, Dressmakers &c. Catalogues on application.

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John Russell Cutlery Co.,

Factories and Office,

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Manufacturers of

TABLE CUTLERY,
Butcher, Painters' and Druggists' Knives

IN GREAT VARIETY.

Extra Hard Rubber Handle Table Cutlery of our own Manufacture.

Fine Ivoride Handle Table Cutlery, very White and Durable.

Sample Office, 77 Chambers St., N. Y.

NORTHAMPTON CUTLERY CO.,

Manufacturers of all kinds of

American Table Cutlery,

Cook, Butcher, Shoe and Hunting Knives.

Sole Agents for Rogers' Cutlery Co.

Plated Forks and Spoons.

D. P. GRIFFITH, Manager, 45 Murray Street, N. Y.

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AWARDED THE MEDAL OF MERIT.

LARGE STOCK OF

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American, German, English

Pen, Pocket & Com-
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Scissors, Scissor Cases,

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TABLE KNIVES AND FORKS OF ALL KINDS,
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And the "Patent Ivory" or Celluloid Knife. These Handles never get loose, are not affected by hot water, and are the most durable knives known. Always call for the Trade Mark "MERIDEN CUTLERY COMPANY" on the blade. Warranted and sold by all dealers in Cutlery, and by the MERIDEN CUTLERY CO., 49 Chambers Street, New York.

ROGERS & BRO.,

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Price Lists and Discounts mailed on receipt of business card or reference. Address

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THE MILLER BROTHERS CUTLERY CO.,

Manufacturers of

PATENT FINE PEN & POCKET CUTLERY

WEST MERIDEN, CONN.

The only knives made that are put together in such a manner that there is no strain on the covering or part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the Best American Knife. We also make

NICKEL & SILVER PLATED POCKET KNIVES

which will not rust or become discolored when used as a Fruit Knife, and their cutting qualities are equal to any other knife. Orders filled from the factory or by

J. CLARK WILSON & CO., 81 Beekman Street, N. Y.

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Manufacturers of

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GROUND EMERY, CORUNDUM AND FLINT,
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NEW YORK KNIFE CO.

MANUFACTURERS OF SUPERIOR

Table & Pocket Cutlery,

WARRANTED TO BE MADE OF THE BEST
MATERIAL.

WALKILL RIVER WORKS,

Walden, Orange Co., New York.

THOS. J. BRADLEY, President.

Wood's Hot Water-Proof Table Cutlery.

Handsome, Cheapest, most Durable Cutlery in use.
Wood's Celebrated Shoe Knives. Butcher
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Cutlery.



JOSEPH S. FISHER,

No. 411 Commerce St., PHILADELPHIA,
AGENT FORGeorge Wostenholm & Son,
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Celebrated I-XL Cutlery, Razors, &c.

AGENT FOR

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Steel and File Manufacturers,

(Rotherham, ENGLAND.)

Corporate Mark.

SPENCER
ROTHERHAM

Granted 1777

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37 Chambers St., New York,

Agent for

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BIRMINGHAM.

JOSEPH ELLIOT & SONS,

Manufacturers of Razors, Table Knives, &c.,
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CORPORATE MARK,



Joseph Rodgers & Sons

(LIMITED)

CELEBRATED CUTLERY,

No. 82 Chambers Street, New York.

CHARLES PEACE, Jr., Agent.

The demand for Joseph Rodgers & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam Power.

To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear their Corporate Mark.

Notice of Removal.

ASLINE WARD,

From 54 Beekman St. to No. 101 and 103
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REPRESENTING

GEO. WOSTENHOLM & SON

CUTLERY AND RAZORS,
WASHINGTON WORKS, SHEFFIELD.

CORPORATE MARK.

FRED'K WARD & CO., SHEFFIELD,

CUTLERY & TABLE KNIVES.

CORPORATE MARK.

B4*ANY

ROMER & CO.,

Established 1837.

Manufacturers of Patent Brass Pad Locks for

Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan

and Sewing Machine Locks.

141 to 145 Railroad Avenue, NEWARK N. J.

Illustrated Catalogues sent on application.

Patented Steam and Hydraulic, April 1, 1868.

EAGLE PACKING,

Of various sizes for ENGINES and PUMPS,

manufactured by JAMES GLANDING & CO., No.

115 Queen St., Philadelphia. What the proprietors

claim for the Eagle Packing: 1. Its general

adaptation to all purposes for which packing is used.

2. Its durability. It will outlast any other article

in use. 3. Its cheapness. It can be furnished to

the consumer at a lower rate than any other packing

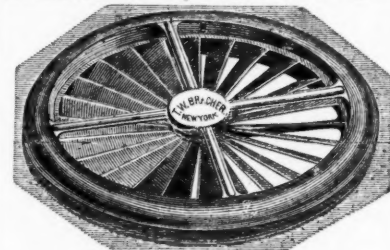
Chains and Car Links by Machinery.

The Pittsburgh Chain and Car Link Manufacturing Company have inaugurated an important enterprise in the manufacture of chains and car links by machinery at New Brighton, Pa. The making of these articles by machinery has never before been successfully accomplished, and nowhere else in the world are chains manufactured except by hand. The machines are the patent of Mr. B. Hersey, of Erie, and consist of a bender, into which the heated iron bars are passed from the furnace, and a power hammer. The "bender" measures the required length of the link upon the bar, cuts it, scarfs it, and bends it as desired. The link dropping from this machine is taken up with a pair of tongs, placed in another furnace, heated, put upon the chain and subjected to the hammering process in the patent combination appliance known as Hersey's power hammer. Here it receives a succession of blows, by which all the slag which prevents a perfect union when the work is done by hand, is dislodged, and in one and a half seconds the welding is so completely done that the link will disintegrate at any other point rather than at the one where it has been united. The hammers can be adjusted to make chains from quarter inch to two inch bars with equal facility. The car links are made in almost the same manner, and machines similar in construction to the ones described are employed. These machines have been submitted to the most critical test possible, in the presence of nearly every iron worker and manufacturer of Pittsburgh, and they have, without an exception, been pronounced a success.

It is the intention of the company to have twelve of these machines in operation in a short time, each of which has the capacity for turning out 250 feet of chain per diem.

The other machinery and appliances now in place in the buildings deserve mention. The engine is of sixty horse-power and capable of running the entire number of machines which it is contemplated to introduce. The blower, which is one of Sturtevant's, is of the largest size. The furnaces are a new patent, and in them the bars can be heated to the requisite degree in ten minutes. It will pay every manufacturer in the city to take a trip to New Brighton for the purpose of examining the furnaces alone. The company, which starts with a capital stock of \$240,000, of which over \$100,000 has already been taken, has been chartered in compliance with the provisions of the new Constitution and the act of Assembly, and is fully organized.

The accompanying illustration represents the "Constant Ventilator," which is constructed for insertion in glass. The features which are novel in this ventilator, and which are patented, are simply points of construction. The diameter of the ventilator is six inches, and it is not unsightly, as is commonly the case in articles of its class, but, on the contrary, is rather ornamental than otherwise, and is finished, to use the manufacturers' expression, "as handsomely as a watch." These ventilators are so nicely constructed that they revolve constantly and



noiselessly either to the right or left, allowing the heated and impure air to escape, and admitting fresh air without draft. They are adapted to any apartment, and are invaluable in bedrooms, offices, studies, schools, &c. Plate glass windows in the fall, winter and spring generally defeat the very purpose for which they are intended, viz., the exhibition of merchandise. The heated air inside and the cold outside causes them to either frost or sweat, so that a passer-by cannot see through them. This the ventilator absolutely prevents, by partially equalizing the temperature on both sides of the sash. They will not tarnish, and can be regulated to revolve slow or fast, or be made airtight with a cap. These goods are manufactured by T. W. Bracher, No. 77 Greene street, N. Y.

The Manufacturing Interests of Louisville.

The Louisville Courier-Journal prints the following: The Louisville and the Kentucky rolling mills, after a suspension of several months, resumed operations about a month ago, and have been working along at a moderate rate with something less than their usual force employed. The proprietors profess to have no definite plans for the winter, and will be governed wholly by circumstances. From present indications, the probability is that they will suspend operations some time during the winter. Unless there should soon come a rise, the want of Pittsburgh coal will be one cause of suspension, but the matter will depend chiefly on the general condition of business. The demand for iron will have little to do with it, as both firms have a large supply of their manufacture in store.

THE BIG PIPE INTEREST OF LOUISVILLE.

This interest is one of the largest in the city of Louisville, and brings considerable money here. Dennis Long & Co., the proprietors of these pipe foundries, as also at the head of the International Pipe Company in Chicago, are liberal and heavy manufacturers. They employ about three hundred men now. Mr. Miller, one of the proprietors, was found sitting in his office by the Courier-Journal reporter, and gave him the necessary information. Their business was quite different from all others, and the

panic had not materially affected them, but to some extent they felt it indirectly through old gas and water companies, to whom they supplied the cast iron pipe, as people economized considerably in these two items after the panic. They have melted this year about 12,000 tons of metal, melting now about sixty eight tons a day, and have built more new gas and water works than in any previous year since the establishment of their business. They had now heavy contracts with Chicago, Indianapolis, Minneapolis, Des Moines and other large Western cities, and for Indianapolis and Chicago alone they would require about 7000 tons of iron to run through about 35 miles of pipe. The competition for these contracts was very close, every leading pipe foundry in the United States making bids for them. What little effect the panic had upon them is passing gradually away, and they are as full of work as in their palmiest days. The prospect for the winter was very fair, and the larger, and probably both, of their foundries would be kept in operation all along.

Their business last year amounted to \$1,000,000, and would exceed it this year in the number of tons, but not in money, as iron had declined very much in price. They have been making for Chicago alone twenty-five miles of pipe yearly, and \$400,000 of the \$1,000,000 came from that city. Their number of workmen was the full quota generally employed by them at all times, and the winter with these workmen would not therefore be very hard.

Encouraged with the results of this interview, the reporter next visited the agricultural works of B. F. Avery & Sons. Here another hopeful showing was given our reporter. Mr. Joseph Avery, one of the partners, was the first person our reporter met. There was nothing gloomy with them. After the panic, he said, they were probably, with the exception of Dennis Long & Co., the only factory in the city that did not close. Notwithstanding the panic, and regardless of depression elsewhere, their business was steadily increasing and spreading itself. The best of their trade was between the months of October and April. At present they were employing about 225 men, which was even a larger number than last year. They found a continued demand for their plows, their business having been thoroughly established. They were paying their employees good wages, and the winter looked only bright and cheerful to them. It would not be so hard as last winter.

Iron Trade Difficulties—Lower Wages Inevitable.

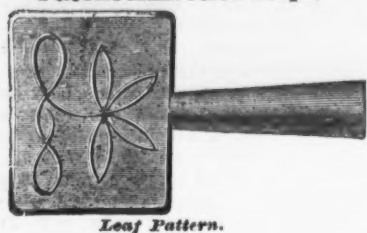
The trouble between the iron workers of Pittsburgh and their employers, especially the puddlers, have not yet been adjusted, so far as reported. On the part of the employers it is claimed that if the market price of iron continues decreasing, a general suspension of operations will inevitably follow, unless the price paid for puddling, etc., is reduced. They hold that the present price of iron, about two and a half cents, does not justify them in paying six dollars per ton for puddling, and that the present sliding scale, on a basis of three cents, card rates, must be changed to meet the depressed condition of the market. It is further claimed that this depression is the result of the high price paid for puddling, six dollars per ton. They also claim that the prices paid at Pittsburgh are from \$1.50 to \$2.25 per ton higher than at other places, which range from \$3.75 to \$4.50. On the other hand, the puddlers pronounce the above statement an unfair one, claiming that it gives prices for which no work is done, and which are causing strikes East and West, rather than that they have been accepted by the employers. Committees on behalf of both parties have been appointed to effect, if possible, a compromise. A joint meeting was held Wednesday, but no compromise was effected. Another conference is set for Saturday, when it is expected some adjustment will be effected by which work will be resumed.

Welding Copper.—Messrs. W. G. Rehbein, H. Roberts and P. E. Brochus, of Baltimore, have patented some improvements for welding copper. The improvements consist, first, in taking the bichloride of soda (borax), and heating it until all its water of crystallization is evaporated, and then pulverizing the dry residuum; next, preparing the two pieces of copper to be welded, so that the surfaces form a lap joint, or any other desired form of union. Then applying the prepared borax on and between the surfaces and hammering them together when hot. The joint thus prepared is brought to a white heat, powdered over quickly with chloride of magnesium, chloride of sodium (salt), or with any of the chlorides or equivalent compounds which may be deemed most suitable for the purpose of excluding the oxygen, and finally welded. The weld or joint thus effected is found to be strong, perfect and durable. Another method by which this weld can be effected is by directing a stream of chlorine gas upon the heated copper during the process of welding.

An "air-brake" for steamships, invented in England, has successfully passed a test. It is designed to prevent the "racing" of the engines when, in a heavy sea, the propeller of a steamship is lifted out of the water, and its revolutions, for want of a resisting medium, are greatly increased. The great strain put upon the machinery of a steamship from the alternate elevation of the propeller above, and its complete immersion in the sea, sometimes results in the breaking of the shaft, and this endangers the safety of the vessel and all on board. The "engine governor," called the air-brake, merely to designate somewhat the manner of its working, is automatic in its operation, and is designed to cut off the steam from the engines the instant a heavy sea begins to lift the propeller out of the water. The adjustment is such that, when or before the propeller is raised out of the water, and before the speed at which it revolves can be accelerated, the shaft has been relieved from all tension by the automatic action of "the governor."

H. D. SMITH & CO., PLANTSVILLE, CONN.

Patent Embossed Steps.



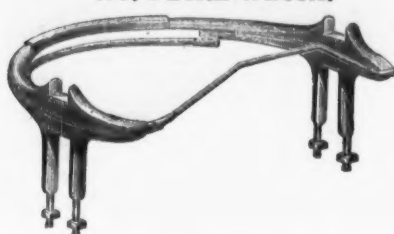
Leaf Pattern.

King Bolt Yokes.

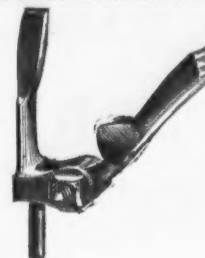


Established 1850.

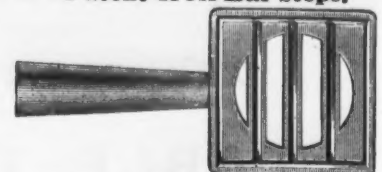
No. 6 Fifth Wheels.



1871 Pattern Shaft Couplings.



Patent Cross Bar Steps.

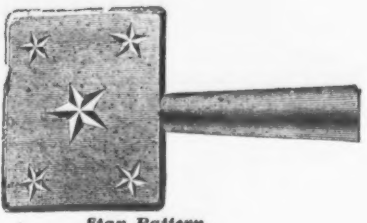
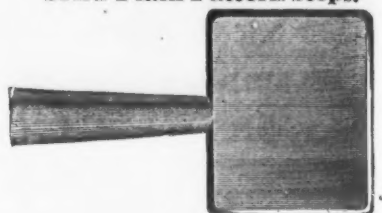


Upper View.



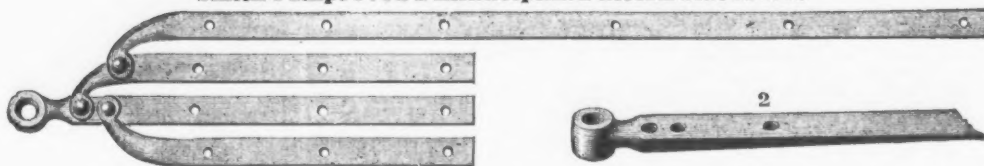
Lower View.

Solid Plain Pattern Steps.



Star Pattern.

Smith's Improved Philadelphia Pattern Slat Irons.



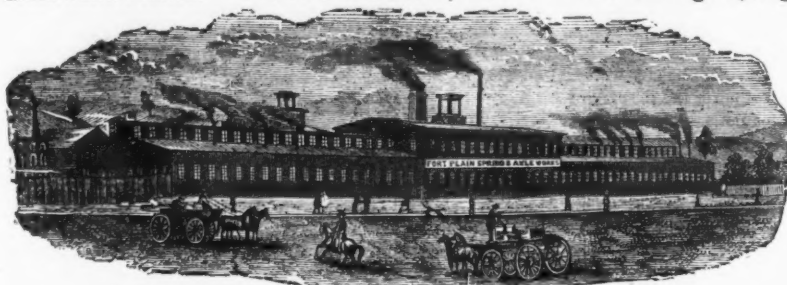
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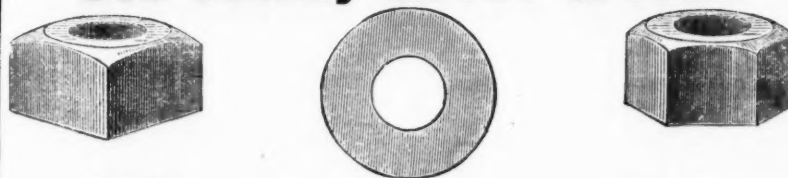
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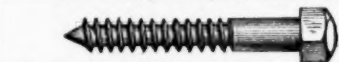
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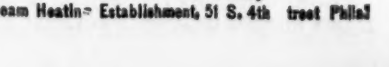
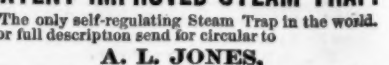
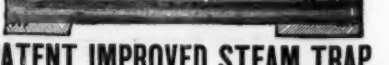
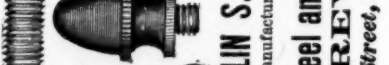
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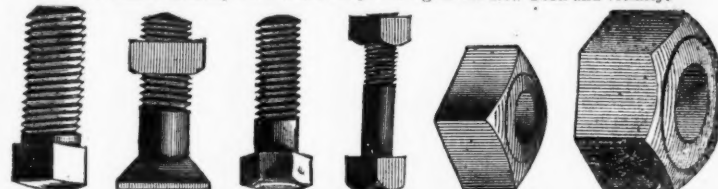
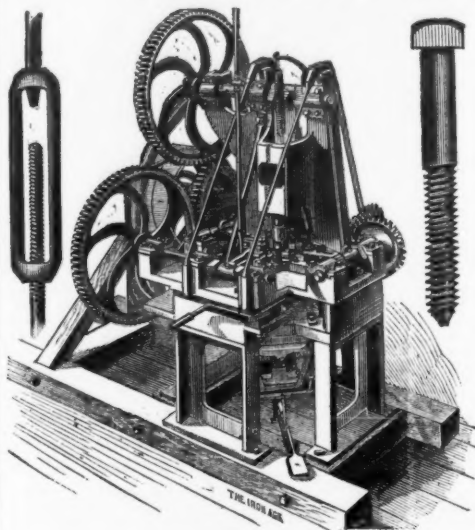
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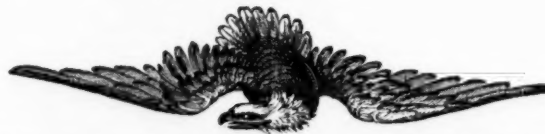
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New York, Thursday, November 26, 1874.

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JAMES C. BAYLES . . . Editor.
JOHN S. KING . . . Business Manager.

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Plain Words to the Workingmen.

If any argument were needed to show that trade unions, as at present organized and conducted, are fraught with danger to the best interests of all classes of the community, it would be found in the effort now making among those representing several branches of the iron trades, to resist the necessary and inevitable decline in wages which must precede the recovery of that great productive industry from the prostrating effects of the panic. The winter upon which we are now entering promises to be one of almost unprecedented dullness, and both masters and men must recognize this unpleasant fact and act accordingly. Many large iron works have already failed, many more are keeping from bankruptcy by making all the iron they can and selling their product below cost, finding it safer to do this than to stop, although either course must lead to ruin sooner or later; and before spring we may expect to witness the closing of many works now making a great show of unprofitable activity. Already labor skilled in all branches of iron working is greatly in excess of the requirements of the trade, and before the end of the year it will be superabundant. Wages have

it is true, declined from ten to 25 per cent., and in some instances more where neither skill nor experience are required; but the ratio of decline in the price of manufactured iron to the decline in the cost of production has been as two or three to one. This condition of affairs cannot continue. If labor will not yield, our furnaces must blow out and our mills close; and the ultimate consequence of trade union folly will be to drive capital out of manufacturing into other and safer investments, leaving labor without employment. These are plain truths, stated in simple language. The most ignorant workingman can understand them, and the most unreasonable partisan of the trade unions must admit their truth. We have sought earnestly and hopefully for some sign of revival in the iron business that would encourage the hope that better times are at hand; but with all our facilities for learning the exact condition of business in all parts of the country, we have found nothing to warrant the belief that any improvement can be expected before spring. Whether it comes then or not will depend upon circumstances. If wages decline to a point that will enable makers and manufacturers of iron to meet the views of consumers without loss, we may expect a gradual but steady improvement in the consumptive demand, with better prices; if wages do not decline, and manufacturing can only be resumed under existing conditions as regards the cost of labor, the trade will not revive, and we shall have before us another year of dullness and stagnation. In view of these facts, which no one who knows the condition of the iron trade of this time will venture to question or deny, the folly of strikes to resist reductions in wages is apparent to the simplest understanding. There are in this city 70,000 able bodied men absolutely without employment, and among them are many skilled iron workers, molders, and pattern makers. In all the great iron making districts there is a growing disproportion between the supply of labor and the demand for it, and every week this disproportion becomes greater. The unions may temporarily resist the tendency of the times, and force embarrassed employers in their emergency to accede to unjust demands, but by so doing they will only hasten the end, and bring upon themselves the evil of enforced idleness. We refer such of our readers as are inclined to doubt the truth of these statements, to the report of the meeting of pig iron makers, which we print on another page of this issue.

The Production and Consumption of Spelter in the United States.

Spelter promises to become one of our leading articles of metallurgical production. Out of 9268 tons which we consumed last year, 6743 tons were American. The remaining 2525 were imported. The metal, in its combinations with copper, was known in Europe many centuries before the Christian era, but as a pure metal it was first imported from China under the denomination *tutenag* or *tulanago*. It was not extensively mined until about the middle of the last century, Upper Silesia, in Prussia, being the principal country of production. The quantity of ore extracted in the Silesian mountains amounted to but 10,000 cwt. in 1783, gradually rising to 17,000 in 1813, 210,000 in 1821, and 309,000 in 1831. The entire Prussian monarchy turned out 1,227,849 cwt. of ore in 1836, and during the ensuing year 995,800. Of metallic spelter Prussia produced in 1826, 195,289 cwt.; in 1829, 132,608; in 1832, 113,179; in 1836, 205,215, and in 1837, 215,466.

Hamburg, the leading European market for the distribution of spelter, received during the ten years from 1843 to 1852 inclusive, 2,175,000 cwt.; during the next ten years, 3,082,000 cwt., and during the decade from 1863 to 1872, 2,841,000 cwt., all from the great inland center, Breslau. From Hamburg it is shipped to all parts of Northern and Central Europe, as well as to the United States, the advances of funds being made to the Silesian mining companies from there, and the spelter consigned in return. A portion of the product of the mines is shipped direct to the inland places of consumption *via* Breslau, but the bulk goes to Hamburg, thence to be distributed. Hence the statistics given above furnish us very accurate data from which to estimate the production of spelter in Silesia. Reducing the cwt. to tons, it will be found that the amount exported by sea was, on an average, 10,870 tons during the first ten years, 15,410 the second decade, and 14,205 the last.

Our own import, almost exclusively from Hamburg, was as follows:

Year.	Tons.	Year.	Tons.
1862	1,400	1868	3,385
1863	2,600	1869	4,390
1864	3,400	1870	3,300
1865	2,400	1871	3,850
1866	4,300	1872	4,300
1867	1,938	1873	2,375

or, on an average, 3948 tons.

Our consumption of foreign spelter was as follows:

Year.	Tons.	Year.	Tons.
1862	4,000	1868	3,885
1863	3,700	1869	4,390
1864	4,000	1870	3,650
1865	3,000	1871	3,850
1866	3,350	1872	4,050
1867	2,138	1873	2,525

or an average of 4238 tons.

By degrees we are becoming independent of foreign spelter, and it will be interesting to note whence we draw our domestic product:

Home Production in 1873.		Tons.
MISSOURI.		
Martindale Zinc Co., St. Louis, Mo.	1,800	
Missouri Zinc Co.	1,400	
Carondelet Zinc Co., Carondelet, Mo.	537	
ILLINOIS.		
Mineral Point Zinc Co., La Salle, Ill.	1,004	
Illinois Zinc Co.	300	
PENNSYLVANIA AND NEW YORK.		
Lehigh Zinc Co., Bethlehem, Pa. (inclusive of Passaic Co.'s production)	586	
New Jersey Zinc Co., New York	441	
New York and vicinity	673	
	6,743	

The Matthiessen & Hegeler Zinc Co., La Salle, consumed its own spelter for sheet zinc. The price obtained for our home product in the New York market is as yet out of all proportion low as compared to the value of foreign in this market. This is in a great measure due to the force of habit on the part of some large brass manufacturers, who, for the sake of uniformity, cling to the foreign article. But gradually the domestic spelter is working itself into favor, and the day will, in all likelihood, not be distant when there will be but a trifling, if any, difference in the market value of European and American spelter at New York.

Several circumstances have co-operated to produce a steadily improving range of prices in Europe. During the early portion of the current year prices of spelter, in common with the other leading metals, had been unduly depressed, while the period of prostration lasted which followed our panic here and in Europe. For a time there seemed to be no bottom to any of them, however well situated from a statistical point of view. Yet, statistically, spelter changed to be in an exceptionally sound position all along; it was demonstrated and acknowledged so, especially in England; still it shared in the general demoralization till the stock at London had sunk so low that it amounted to but 12½ per cent. of an average available supply. While this had been preparing, an extra demand manifested itself for France, armaments lying at the bottom of it. The summer being an unusually dry one in Germany, there was a lack of water in the mountains for power, and for carriage down to the shipping places; hence a diminished production and conveyance to port. The more expensive forwarding by rail had finally to be resorted to, and the cost of the metal was enhanced, superadded to which came the greater buoyancy of the general metal markets since the commencement of last month, causing a continual hardening process, from all appearances not yet arrested, so far as this metal is concerned.

Although the general metal markets have been rapidly advancing, they are as yet far from having reached the extreme range that ruled the value of copper and spelter subsequent to the last Continental war, during the year 1872. Should peace be preserved, money remain tolerably easy, and trade prove brisk in the spring, it is not unlikely that the highest prices will be recovered, which circumstance would then greatly operate to the advantage of this growing industry—the production of spelter.

The Meeting of Furnace Owners.

On another page we publish a telegraphic report of the meeting of pig iron manufacturers held on Tuesday at the rooms of the American Iron and Steel Association, in Philadelphia. The view of the condition and prospects of the iron trade taken by the meeting, as expressed in the resolutions adopted, is gloomy indeed, though fully warranted by the facts of the case. The unanimous opinion of those present was, that the only way to save the iron trade from ruin is to further curtail the production of pig metal. Considering the number of furnaces already out of blast, this amounts, practically, to a recommendation that production be almost wholly stopped. In this matter, as in all others affecting their business policy, manufacturers will probably be governed by considerations of self-interest, and we doubt very much if they will be influenced in any material degree by resolutions or the reports of committees. It must be admitted, however, that it is the part of wisdom just now to avoid piling up stocks of pig iron to depress the market when there shall be a revival of the consumptive demand. Whether it is more hazardous to blow out or to sell iron at or a trifle below cost is a question which every furnace owner must and will decide for himself. Probably there are some who cannot afford to blow out so long as they can sell iron at any

price, and others who can make running expenses out of current sales of their higher grades of pig iron. But it cannot be denied that the resolutions given in our report of the meeting point out the only way in which the trade of next year can be saved from the depression which has characterized the trade of this. The feeling now prevails among well informed representatives of the iron trade with whom we have conversed during the past few days, that iron will go still lower, and that next year will see prices quoted far below the lowest yet reported. We hope this prediction will fail of realization, but nothing will insure that result sooner or more certainly than a continued over-production and the accumulation of large stocks of pig iron to be forced upon the market at any price which can be obtained for it. Comparatively few of our ironmasters can afford to carry stocks for any considerable time, and so long as makers stand ready to meet the views of consumers, so long will we have a depressed market, a lack of confidence, and general "hard times" in the iron trade.

Needed Reforms in the American Institute Exhibitions.

The forty-third exhibition of the American Institute closed on Saturday night. As a place of resort for throngs of people, young and old, it served an excellent purpose; as an exhibition of the industrial arts, manufactures and products of the country, it cannot be said to have amounted to very much. There were, of course, many interesting and important exhibits which would well repay examination had one been able to find them among the countless commonplace articles shown merely to advertise the manufacturers. But, as a whole, the exhibition was a disappointment, and one saw in every department the same old things which had been shown from year to year since our earliest recollection. For this, however, the managers are not to blame. We have no doubt they made all reasonable efforts to secure as great a variety of exhibits as possible, and they are entitled to credit for what they accomplished in that direction. But for one feature of the exhibition they are to be blamed, and that is the license taken by the vendors of articles who had taken out selling permits. As usual, the methods taken to attract attention and induce purchases were calculated to annoy visitors, if not to disgust them. Brazen-faced young women and loud-mouthed men importuned the visitor at every turn, boys with cards and circulars confronted one at every step, and glass blowers and jig saw operators forced their worthless productions upon unwilling purchasers at preposterous prices. In other words, too many people were allowed to make nuisances of themselves, and we hope another year will witness a reform in this respect. There is also room for improvement in the official catalogue, which this year was little more than an advertising medium, practically worthless for the purpose for which it was intended: also in the manner of making and declaring the awards of premiums. This should be done in time to give exhibitors a chance to appeal from the decision of the jurors to the Board of Directors. We know of at least one instance in which we think gross injustice was done to an exhibitor by a committee of jurors, who failed to give his exhibit the careful consideration to which its importance entitled it, and whose report was little better than none at all. There is no good reason why exhibitors, competing for the honors promised by the Institute, should have their claims finally passed upon by jurors who have neither the time nor the inclination to properly examine them. Every exhibitor should know at least a week before the close of the fair what report has been made upon his claims, and have the privilege of appealing to the Board of Managers for a special examination of his invention or exhibit by a committee of experts when, in the estimation of the Board, the jurors have not done him full justice. These are matters which should be looked after. Under existing conditions we do not wonder that so many manufacturers and inventors will not take the trouble or incur the expense of entering their goods for exhibition.

A correspondent of one of our daily papers, writing from Philadelphia, communicates the startling intelligence of a "wonderful discovery" in mechanics, which is to give us unbounded power, at a cost next to nothing, and to supersede steam as steam has superseded wind and water. We are, unhappily, left in ignorance as to what the new motor is, except that it somehow employs water in place of steam, and that it has developed a power of "seven thousand pounds to the square inch," by the decomposition of water

and the rapid disengagement of hydrogen and oxygen. A number of gentlemen in Philadelphia are said to have contributed money to carry out this invention, and in this city Messrs. John J. Cisco, Israel Course and Hatch, of Fisk & Hatch, are said to be financially interested. Some recent tests are described as follows:

Then Mr. Keeley poured in a quantity of water from the hydrant and closed up the opening. "Instantaneously," to use the words of those present, "there was developed a pressure of 7000 pounds." This pressure was measured by a safety valve apparatus with a proper leverage. Of course no steam gauge, as at present constructed, could be made to record such a pressure. This was the test that was made. The enormous pressure is to be utilized by means of an engine with a cylinder and piston, in all essential respects like a steam engine. Some months ago, it is said, a small 5-inch stroke engine was connected with the power-generating apparatus, and was operated with such extreme rapidity that, though it was stoutly bolted to a strong wooden bench, it shook itself loose. Mr. Keeley says the power generated is inexhaustible, and will be supplied as fast as it can be used in a cylinder. The fact that it has been made to operate a steam engine makes it certain, of course, that the expansive force is due either to a vapor or a gas.

We invite the attention of the Philadelphia police to this dangerous machine. If it should ever break loose and get away from the inventor, the story of its ravages in that now peaceful and happy city would be far worse than the bloody performances of the wild beasts in the Central Park a few days ago.

Below will be found an article of much interest on books of account and memoranda as evidence. The subject is presented tersely and clearly, illustrated with cases taken from the records of the courts. Experience has shown that very few of our business men have a correct idea of the conditions under which their books and business records may be used as evidence for or against them in suits at law. The article to which we have called attention has been prepared for us by a gentleman prominently identified with the practice of the higher courts, and will be found both interesting and valuable.

Books of Account and Memoranda as Evidence.

Books of account are indispensable to the merchant, mechanic or professional man. The memory is not equal to the task of retaining a mass of details, accounts and events of every day life. Such books form an epitomized statement of the business of him who keeps them. They are a record of the past, and, at the same time, a guide to him in the future conduct of his business. Without them he would not himself know his business condition. If his affairs are ever brought under the scrutiny of a court of justice, his books are important witnesses either for or against him. They tell the story of his prosperity or adversity. The courts regard them as of great importance to aid or corroborate the testimony of witnesses; but at the same time they admit them as evidence with great caution, and apply strict rules to them. It is important to every business man to know whether he is keeping his books in such a way that they will stand the test of a court.

Under the common law of England, books of account were not admissible as evidence, but the colonies did admit them, contrary to the rule of the common law. In New York in the times of the Dutch, full faith and credit were given to a merchant's books, especially when strengthened by his oath, and this usage was probably introduced from Holland (see Conklin vs. Siamler, 17 How, 399). From this common law of the colonies has sprung the present enlarged rule, which is substantially the rule in all the States. It may be stated as follows: To render a book of account admissible as evidence, the following facts must be proved: That the book is the original book of entries; that the entry in question is in the handwriting of the witness, or that he who made the entry is dead, and that the entry is in the handwriting of the deceased; that it was made at or near the time of the transaction it records; that the witness does not recollect the transaction independent of the entry; that the entry was correct when he made it; that the party who offers the book in evidence keeps fair and honest books of account, which must be proved by those who have dealt with him, and settled with him by his books; and that a portion of the articles specified in the account were actually delivered.

The different clauses of this rule have been established and illustrated by various decisions of our courts. Some of the cases are quite interesting.

First, the book must be an original book of entries; that is, the book in which the entries were first made. It must not be a book whose entries were transcribed from any other book or memoranda. The day book is usually the original book of entries; the ledger and other books are of little value in a court room. If the entries were transcribed into the day book from a waste book or slate, the latter are the originals, unless it can be shown that the entries were transcribed on the same day or within a day or two after they were made on the slate or waste book, and that this was the regular course of business from day to day, in which case only an exception is made to the general rule.

In Marclay vs. Shultz, 29, N. Y., 346, plaintiff sued to recover damages for overflow of his lands, caused by defendant's mill-dam. He produced a witness who swore that he had measured certain flush boards on the dam, had made a memorandum first on a paper, then marked it on the side of a shop, and had in

court a copy of the marks on the shop. Held that the copy was not evidence, not being the original entry. The rule as to any memorandum is the same as to entries in an account book. See *Guy v. Mead*, 22 N. Y., 465, also *Halsey v. Sinebaugh*, 15 N. Y., 485.

The case of *Stroud vs. Tilton*, 3 Keyes, 139, was a Court of Appeals decision. It was a suit for services. The plaintiff proved that the usual course of business in his establishment was to enter each day's work on a slate, that the entries were then transcribed from day to day by the bookkeeper in a book, and the entries on the slate were erased. The court held that the book should be admitted in evidence, it having been proved that the entries were transcribed from day to day in the usual course of business.

In *Sickles vs. Mather*, 20 Wend., 72, the entries were made on a slate, and every day or every two or three days they were transcribed in a book. Held that the book was evidence. A case was there mentioned of a butcher, who marked sales of meat in chalk on his cart, and every day on the return of the cart from the daily trip, the partner of the butcher transcribed the marks in a book, and the book was admitted.

In *Merrill vs. I. & O. R. R. Co.*, 16 Wend., 586, a case is cited in which the witness, a clerk, was allowed to use the ledger as a book of original entry, where he had first entered the sales in a wastebook, which the plaintiff copied day by day in the ledger in the clerk's presence, who checked them as they were copied.

In the next place, the party who made the entry must be produced as a witness if he is living. In the case last cited, the plaintiff offered books of account kept by various superintendents of different sections of a railroad, in which were entered names of laborers under them, and the number of hours each worked every day. Sometimes in the absence of the superintendents their clerks made entries. A few of the superintendents, but not all, testified as to the entries, and none of the clerks were produced, and it was not proved that the absent superintendents and clerks were dead. It was held that the books should be excluded on this account.

In *Stroud vs. Tilton*, cited above, it was proved that the clerk who made the entries was dead, and upon this proof the book was admitted with further proof that the entries were in the handwriting of the deceased. In some States the books are admitted upon proof that the clerk is beyond the jurisdiction of the court or out of the State; in others the rule is that the testimony of the clerk must be obtained, if he is living, no matter where he is. (See *Brewster vs. Doane*, 2 Hill, 537.)

Again, the entry is not admissible, unless made at or near the time of the transaction. In some of our States it has been held that the entry must be made the same day of the transaction, or the next day after. Greater latitude was allowed in *Sickles vs. Mather*, cited above. There the entries were transcribed from the slate into the book "every day or every two or three days." This, it is believed, is the longest time spoken of in any reported case, and in this case it was the regular course of business.

In *Halsey vs. Sinebaugh*, 15 N. Y., 485, it was said that an original memorandum made by the witness presently after the facts happened, and proved by the same witness, may be read by him in evidence. In *Russell vs. H. R. R. Co.*, 17 N. Y., 134, it is said, that it is the duty of the court to see before receiving the memorandum in evidence, that it was made at or about the time of the transaction.

In the next place, it must be proved that the witness does not recollect the facts, before the book or memorandum will be allowed to be evidence of them. If the witness remembers the facts, he must testify from his memory; if after refreshing his memory by looking at the entry, he remembers the facts, he must testify to them from his memory; but if after doing this, he has no recollection whatever of the facts, but can say that he does not doubt the correctness of the entry, it will then be allowed in evidence. In *Marley vs. Shults*, cited above, one reason for excluding the memorandum was that it was not shown that the witness did not remember the facts without it.

In *Guy vs. Mead*, 22 N. Y., 465, the court decided that original memoranda may be put in evidence even if the witness has wholly forgotten the facts, and this need not be entries in the usual course of business, but may be any memorandum. To put it in evidence, however, it must be shown that the witness did not have a perfect recollection of the facts sought to be proved by the memorandum.

In *Russell vs. H. R. R. Co.*, cited above, the court said: "A witness who says that after refreshing his memory by a written memorandum made by himself at or about the time of the occurrence, he cannot recollect the facts, but that he is confident that he knew the memorandum to be correct when it was made, is not required to swear to the facts in positive terms, but the memorandum itself is received in connection with, and as auxiliary to, the oral testimony." * * * "It is, however, an indispensable preliminary to the introduction of such a memorandum in evidence, that it should appear * * * that the witness is unable with the aid of the memorandum to speak from memory as to the facts."

In *Conklin vs. Stanler*, cited above, it was decided that the rule as to books is that the party must resort to them to refresh his memory, and in case they fail to refresh his memory, he can then put them in evidence provided he can swear that he has entirely forgotten the facts, and can swear that he would not have entered them if he had not known them at the time to be true, and that he believes them to be correct.

Again, the rule requires that the books be shown to be the books of account of the party, and that he keeps correct books. This was first clearly laid down in *Bosburgh vs. Thayer*,

12 Johnson, 461, where it is said that it must be shown that the party keeps fair and honest accounts by witnesses who have dealt and settled with him by his books. This portion of the rule has been recognized in several decisions since. It is spoken of as one of the necessary preliminaries to the admission of books of account in *Stroud vs. Tilton*, cited above, where the court said: "The general correctness of the books was shown by those who had dealt with the plaintiff, and the accuracy of the charges in question was verified by his own oath." It was further said: There is no force in the objection that the witnesses who proved the correctness of the books settled their accounts by the ledger, without examination of the original entries. If the charges as posted and paid were honest, it is to be presumed that they were correct as entered in the day books."

Lastly, it must be shown that one or more of the articles specified in the account were actually delivered. In *Conklin vs. Stanler*, cited above, the only proof was that the plaintiff had no bookkeeper, and that persons dealing with him had settled with him by his books. There was no evidence that the defendant dealt with him, or of the delivery of any of the articles, and the case was reversed for this reason. In *Stroud vs. Tilton*, the court speak of part of the property having been delivered to defendant as necessary preliminary proof. This was a suit for work and materials furnished in making and repairing guns, and the evidence showed that one of the guns had been delivered, which was held sufficient.

The action of *Merrill vs. Whitehead*, 4 E. D. Smith, 239, was for physician's services, rendered between April 1851 and 1853. The proof showed that once in 1849 the physician had attended the defendant. The court said that proof of a single attendance two years previous to the entries in the book was wholly insufficient to satisfy the rule, and for that reason the book ought not to have been received.

It will be readily seen from the strictness of this rule that it is often difficult for a merchant to recover in an action on an account. It is sometimes difficult and always expensive to procure the testimony of the clerk who made the entries, when he is absent in a distant State or foreign country. Sometimes the clerk has been dismissed and is hostile to his employer. Merchants often fail in proving a delivery. The clerk who made the entries often does not see an article delivered, and it is sometimes difficult to obtain the testimony of him who actually made the delivery. Sometimes the articles are called out to the bookkeeper by another clerk as they are delivered. The bookkeeper in that case cannot swear as to the correctness of the entry, and he who made the calls to him must be produced, or it must be shown that this was the usual daily course of business. It is sometimes not easy to prove even that a merchant kept correct books, especially if he has been long out of business or is deceased. In *Merrill vs. Whitehead*, cited above, the court said: "Where the book is supported only by the oath of one witness who testifies that he has settled thereby and found it correct, and is impeached by the evidence of another witness, who testified that he has settled thereby, or on settlement has examined the same for that purpose and found it incorrect, and that on such settlement the error was corrected, the book ought not to be deemed sufficient evidence to warrant a recovery unless there is something disclosed to discredit the testimony of such impeaching witness."

The reason why the rule of the law is so strict is that the books are an unsworn statement made by the party himself in his own favor. When, however, the books are properly authenticated under the rule, they are evidence for the party even after his decease and the decease of his clerks and bookkeeper.

PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, Nov. 23, 1874.

As winter approaches the discontent among the laboring classes appears to increase apace, and in all directions we learn of strikes, labor contests, and growing difficulties. From Pittsburgh the most threatening accounts are received of the determination of the boilers and other mill hands to resist any reduction of wages, while the manufacturers are as positive in their intentions to stop all production unless its cost is lessened. In the coal regions, especially in Schuylkill and Luzerne counties, the lawlessness of the miners is becoming such as to seriously endanger life and property, and to call for the interference of the authorities. This state of affairs is not likely to be decreased by the approaching stoppage of all the Reading Coal and Iron Company's collieries very shortly, and the entire cessation of coal production in the Schuylkill coal field by the 30th of December. What the thousands of miners and those dependent on them are to do without earnings until spring, does not appear, but idleness will not improve either their physical or moral condition. Even in this city, where the working classes are, as a rule, better employed than in most other places, the Mayor is constantly receiving letters of a threatening character and agrarian tone, promising riot and arson unless employment is provided. With such a state of things existing the coming Congress will enter upon its duties with a lively apprehension of an exciting session, in which action will be stimulated by popular expressions most forcibly put. Capitalists are said to be growing apprehensive of new measures looking to so-called inflation; but in the present condition of the national credit, the country can better stand an increase of indebtedness than a continuance of the stagnation which will ultimately produce the same effect by decreasing the taxpaying power of the people.

As this is the documentary period of the year, we begin to receive the reports of heads of departments; the most important of which

to hand is that of the Commissioner of Internal Revenue. This document shows that the receipts from all taxable sources coming under special taxation were very considerably in excess of the estimates, as also of those of the previous fiscal year, and notably that notwithstanding the much vaunted economy since the panic, the receipts from liquors, cigars and tobacco were far greater than ever before. Indeed, these articles are shown to be highly valuable articles of national revenue, whatever they may be of individual health or morality. On the whole, the report shows a rather agreeable state of affairs, and if all the other departments are to furnish such rose colored reports for the panic year, we will wonder what we have to complain of.

We have had here recently two rather curious decisions in commercial law. The first is by the Supreme Court of Pennsylvania, involving the liability of a firm for a note indorsed in the firm name by one partner without knowledge or consent of the other members. The facts are as follows: The National Bank of Titusville brought suit on an indorsement of Collins Brothers on a note bearing the name of the firm, given without the knowledge or consent of the other members. The bank, plaintiffs in the lower court, having filed a copy of the note, the defendants filed separate affidavits of defense, setting forth the fact that it was so indorsed; that the firm had no interest in the note, and never received any consideration for the indorsement thereof, and that it was not indorsed in the regular course of their business. Two of the members swore that they never received any notice of protest, but the third did not.

Upon a rule to show cause why judgment should not be entered for want of a sufficient affidavit of defense, the court entered judgment for plaintiff.

The higher court expressed the opinion that notice of protest to one member of a firm was sufficient, and affirmed the judgment in favor of the bank.

The second case comes under the law of trade marks, and was a decision by the Court of Common Pleas, of this city, in a motion for injunction against alleged infringement. The plaintiff, manufacturer of an article of stove polish, having adopted as his trade mark the title of "Rising Sun," accompanied by a design representing that luminary, applied for an injunction restraining defendant from the use of a similar trade mark, in device and color, with the simple substitution of "Moon" for "Sun." The court decides that the sun and moon are radically different luminaries in trade mark law, even when both printed in the same ink, on the same colored paper, and that no infringement was committed sufficiently to justify injunction. This shows how nicely lines may be drawn in legal commerce, but is not encouraging to commercial morality.

Mr. Henry C. Carey has just published the first of a series of open letters to the President on the subject of the Commercial Treaties of 1874 and 1874, or, in other words, of the Reciprocity Treaty. Mr. Carey shows, as he always does, by facts and figures, the iniquity of this measure, which seems to receive hard knocks all around. By a tabulation of balances of trade with the Dominion for the periods from 1863 to 1866, he shows that under reciprocity previously our sales in the Dominion steadily declined, while our purchases materially increased. So plainly was this evident that in a report before the Senate in 1871 the evil effects were universally admitted, and it was only by the secret and unprecedented effort to foist the present negotiation upon that body that the subject was reopened. In subsequent letters Mr. Carey promises to invite the President's attention to the fallacy of the statements contained in the document proposing the treaty of 1874. As he is most thoroughly and efficiently armed with authorities, and moreover possesses an amount of patriotic honesty quite unusual in public life, our industries may be sure the Reciprocity fraud will be most fully and thoroughly ventilated before the present Congress meets.

While noting the numerous devices of free trade, among which is a threatened move on the part of importers of textile fabrics at the next session, we have to chronicle a counter movement proposed here. This is a display, under the auspices of the Franklin Institute, of American textile fabrics, to open about December 15th next, and continue some thirty days or more. It is the Textile Fabric Association, the New England Manufacturers' Association and the American Silk Association will all co-operate, and while the success of the show as an exhibition of American manufactures will be very marked, the effect against any reduction in duties will be equally so. It would be a good idea for the iron trade, or such branches as are threatened with the attacks of free trade, to join in a similar movement, and show comparative samples of American and English goods, with actual wages, cost of manufacture, etc., of each.

The coming meeting of the furnace owners, to agree on a policy of universal stoppage, is attracting a good deal of attention. Could this be effected, it would undoubtedly advance iron or reduce stocks, but it is very doubtful if, under the very different conditions dominant in the various sections, any such action could be made universal, or even, if agreed on, could be maintained.

So far as pig iron is concerned the trade is worse than dull. Possibly a stoppage would help it, but at a cost to both capital and labor which would be at least equal to any benefit.

Is the Specie Basis Attainable?

The answer to this question must depend very much upon what particular condition of things we have in view in using the term specie basis. If we contemplate, in the idea of resuming specie payments, a state of affairs in which not only will the treasury stand prepared to pay all its obligations in gold, but the banks also will be obligated to honor their notes and to pay their deposits in specie; if we have in view the restoration of the same obligation to pay government, bank and private debts in gold as existed prior to suspension; we fear that the obstacles to the end sought must be pronounced almost if not absolutely insurmountable. For what does resumption in this sense imply? We will rid the question of one important difficulty by supposing that the legal tender notes, either by funding or some other means, have been got out of the way, so as to relieve the treasury of any necessity to hold a stock of gold to provide for the redemption of its circulating notes, thus placing the problem in the easiest form possible. The treasury, however, would still have to provide for large periodic interest payments aggregating \$100,000,000 a year, in addition to its regular daily disbursements; and, to provide for these demands, we think it will be conceded that an average coin balance of about \$30,000,000 would be regarded as necessary to be maintained in the hands of the government.

Next, would come the specie requirements of the banks. United States notes being, upon the supposition here entertained, no longer a part of the lawful money of the nation, their present place in our banking arrangements would have to be filled by specie. The amount that would be required may be judged from the fact that the national banks hold about \$630,000,000 of deposits and the State banks probably fully \$70,000,000, making a total of \$700,000,000 of deposits. Beside this, the banks have \$350,000,000 of demand notes outstanding; and, if the "greenbacks" were withdrawn, it would be found necessary to supply their place by bank notes; which would increase the bank note issues up to about \$700,000,000. Now it will hardly be supposed that the banks, even if freed from all legal compulsion in the matter, would keep a lower reserve against their deposits than 20 per cent.; the probability rather is that this form of reserve would average higher than that ratio; on the rate, however, we have suggested as a minimum, the banks would require an aggregate coin reserve against their \$700,000,000 deposits of \$140,000,000. The note obligations of the banks, considering the bond security by which they are backed, could not be regarded as needing so large a reserve as deposits. Assuming that 10 per cent. might be regarded as adequate, then the amount of reserve required against the requisite note issues—supposed as above to be \$700,000,000—would amount to \$70,000,000. The banks, therefore, would require, as the minimum amount of reserve against deposits and circulation combined, \$210,000,000 of specie. To provide, however, against possible variations in the demand for gold, connected with the revenue and with the exports to foreign countries, the banks would need to hold an amount in excess of the minimum reserve requirements, or, say in all \$225,000,000. How far this estimate is fair may be judged from the fact that for the five years next preceding 1861, under just such a specie basis as we are supposing to be contemplated for the future, the deposits and circulation combined averaged \$428,000,000, while the specie averaged \$78,000,000. The reserve we have suggested as necessary for the supposed state of things in future would be 16 per cent. on the circulation and deposits combined; while for the six antebellum years the ratio averaged 18½ per cent. Beyond these requirements for specie, a certain amount would be needed for circulation in the hands of the people. Immediately before the war the amount of coin thus circulating was generally estimated at about \$75,000,000; but as our now improved bank note commands more confidence than that form of currency did before the war, we may stipulate the much more moderate figure of \$40,000,000 as sufficient to satisfy these wants in the Atlantic States. Summarising these various coin requirements, we have the following result:

Required for Treasury purposes.....	\$30,000,000
" " Banking reserves.....	225,000,000
" " active circulation.....	40,000,000
Total.....	\$295,000,000

These estimates are based upon the narrowest ideas of banking requirements, and are far from coming up to the standard set up by the advocates of "conservative" banking, and the rates of bank reserve contemplated are less than half those insisted upon under the European financial systems. If, therefore, we have erred in these figures, it is on the side of under-estimate.

It follows, then, that to undertake the resumption of specie payments, on the basis supposed at the outset of our remarks, we must have a stock of specie in the Atlantic States amounting to not less than \$300,000,000. We have already, in the Treasury, in the banks and in private hoards about \$90,000,000 toward that amount, and would therefore need to accumulate \$210,000,000 of additional supply. Where could this amount of the precious metals be procured? We know of no sources of supply except those already existing in the European banks and the current product of our mines. What could we hope to get from either?

In the national banks of England, France, Prussia, Austria and Belgium, there is now an aggregate stock of \$600,000,000 of the precious metals. Nine-tenths of this amount is required to enable these institutions to conform to the legal conditions on which they are required to conduct their operations; and to part with the remaining one-tenth (amounting to \$60,000,000) would produce a stringency in the European money markets verging closely on general panic. It so happens, owing to the peculiar exchange relations between the several European money markets, that when any unusual amount of specie is withdrawn from Europe, the weight of the demand falls first and chiefly on the Bank of England; and it is not necessary to state what is the effect on that very sensitive financial organism of a withdrawal of even \$20,000,000 from its vaults. Its vast power over the exchanges of the whole world are at once put in force to draw back the lost treasure, and the world's money markets are allowed no rest until the bank's reserves are again squared with the conservative ideas of its managers. There are many who have talked glibly of our importing \$200,000,000 of gold from Europe, but we have yet to be informed by what sort of financial legerdemain the feat is to be achieved of abstracting from the European banks gold which they cannot and will not part with. Is our power over the Bank of England, the Bank of France or the Bank of Prussia so preponderating that we can compel them to transfer their gold to us at will? Can we, either by selling bonds abroad or by increasing our exports over our imports, draw more gold from London than the Bank of England is willing to part with? No; and for the reason that, in a contest between the money markets of London and of New York, the latter always proves the weaker. Even assuming that, by a shrewdly conducted negotiation, we could sell

\$200,000,000 of government bonds in Europe, thereby giving us a claim on that amount of foreign gold, the effect on the London money market and on the exchanges would be such as to stop entirely the ordinary negotiations of our corporate loans in Europe, amounting to about \$100,000,000 per annum, to send back large amounts of our securities, to induce European consignments of goods to this country, and to reduce the value and the volume of our exports—for this is the way in which an adverse condition of the London money market always operates on our interests—and therefore any gold that we might acquire by such a process would be much less in amount than was expected, and it could be retained only very temporarily, for a few weeks or months at most; we must inevitably surrender it back to the stronger party in the contest. For these reasons, we think it will be admitted that the idea of drawing a stock of gold from the European reservoirs betrays an entire ignorance of or indifference to the nature and workings of the foreign exchanges, and must be abandoned as hopeless.

Nor is there any better prospect of our being able to detain at home any material portion of our current production of gold. The current supply of the precious metals from the United States is as indisposable to the financial and commercial system of Europe as are its present stocks of them; and to withhold any portion of our production would react upon us in just the same way as would a withdrawal from their existing supply. To retain at home, by some forcible process, so many millions of the yield of California, would be to deprive us of so much means for settling our current foreign indebtedness; which would produce embarrassment in the exchanges that could result only in one possible way, viz., to compel us to remit an amount of specie equal to that we were arbitrarily holding back. Such an attempt at forcible hoarding could cause a vast amount of injury to our whole commercial system, and would certainly precipitate panic, but it could not succeed in retaining in the country gold which the condition of the exchanges required to be sent abroad. If our power over the European money markets were such that we could compel the several countries to so reconstruct their banking and monetary systems as to conduct their operations with a less amount of specie than at present, we might possibly, at a large sacrifice and after a long struggle, succeed in getting from them permanently a certain portion of their present specie reserves; but we have not yet attained to any such financial puissance.

If the foregoing considerations do not conclusively prove that it is utterly out of the question to hope for the restoration of such a specie basis as existed before the war, or for any form of resumption which requires a very large accumulation of specie, we shall be most glad to have it pointed out where our argument fails; for the question is too important to be treated otherwise than with the utmost regard for just conclusions.—N. Y. Daily Bulletin.

The Charlotte Furnace.—A correspondent of *Frank Cowan's Paper* gives the product of the Charlotte Furnace, which of late has exhibited a marked increase. The ordinary rate had been 265 tons per week. For the week ending October 24th, her product was 291 tons, and for that ending October 31st, it reached 319½ tons, with no signs of diminution at last accounts! The proportions of native Lake Superior and hematite ores have not been changed, and the coke and limestone are the same. The causes of the increase are thus given: Lower temperature and consequent dryness of the air; the dry condition of the stock, both ores and fuel, no rain having fallen at the furnace for several weeks; and the fact that the ores have been comparatively free from clay, slate, etc., the result of more careful selection at the mines and in the stockpiles. The ores used have been Lake Superior, one-eighth, balance about equally divided between "Bloomfield" (brown hematite) and native carbonates—average yield being forty-five per cent. The temperature of the hot blast has not been increased—it being the rule never to carry over eight hundred degrees F. The correspondent remarks that more iron could doubtless be produced with a higher temperature of blast, but it would be at the expense of the hot blast pipes, and quality of metal.

The Saratoga Compact.—From present indications it would appear that the compact made between the railroads at Saratoga, a few months ago, relative to freight rates, has not proved an unqualified success. It is now understood that the Erie considers the compact prejudicial to its interests, and that it will seize the first opportunity to withdraw. The Michigan Central, the Grand Trunk and one or two of the other Western roads make the same complaint, and it is known they will withdraw as soon as possible. During the days of competition these roads were able to obtain a large amount of both passenger and freight traffic by means of runners, agents and low rates, but now since competition has been stopped these roads find a falling off in their receipts, or in other words, they cannot afford to do business in a thoroughly legitimate way as the other through lines are able to surpass them, and therefore they must depend upon competition. The action of the Baltimore and Ohio in refusing to join the compact is understood to be the chief cause of all the trouble. This line now gets a large portion of through Western freight which was formerly distributed among all the other lines. Their rates are lower, and therefore they are favored. It is anticipated that these circumstances will lead to a total abrogation of all the details of the Saratoga conference, and that within a few months the through lines will enter upon the same competitive policy as was formerly in vogue.

The Fire Alarm and Police Telegraph System.

To any one who reflects upon the rapid progress usually made by a fire, it is obvious that the saving of a very few minutes—oftentimes the saving of a minute, even—is of the greatest importance, and may make the difference between a trifling loss and a destructive conflagration. It is a matter of common observation that most fires are discovered before they have made great progress, and at a time when they might easily be subdued if the means were then at hand. Actuated by these considerations, Dr. Wm. F. Channing, of Boston, in the year 1845—just one year after the introduction of the electro-magnetic telegraph into the United States—suggested the possibility of telegraphic fire alarms, and published the details of his plan.

The first mention of such a thing attracted some attention; but, like the telegraph itself, it was regarded as of doubtful utility, and capitalists would render no aid to its introduction. The fact is, but few minds had the faintest conception of the importance and endless variety of applications of the new-born art of electro-magnetic telegraphy. It was not until 1851 that the City of Boston could be induced to appropriate \$10,000 to try the experiment. Calling to his aid Mr. Moses G. Farner, of Salem, one of the best electricians in the United States, who devised most of the original apparatus, Dr. Channing put his system in practical operation during the spring of 1852. Although far from perfect in detail and construction, the grand idea was developed. From that day to this—a period of over 18 years—electricity has kept watch over millions of lives and property in the principal cities of the United States and British Provinces. Experience has proved it an ever vigilant and faithful sentinel. It not only affords the means of giving an instantaneous alarm in case of fire but indicates its exact locality, by which prompt and definite action a limited supply of water is more effectual in preventing large conflagrations than the best water works would be without a telegraph.

Since its introduction in 1852 many valuable improvements have been made and patented. Its introduction and satisfactory operation in fifty-six cities attest the truth of what Professor Henry, the intellectual giant of the Smithsonian Institute, has said of it, viz.: that "it is one of the most ingenious and successful applications of electricity to the business of life which has yet been made."

THE AUTOMATIC SYSTEM.

The automatic system is fully adapted to the wants of all but the very largest cities, and its apparatus and operation may be briefly described as follows:

1st. The signal boxes, from which alarms are conveyed to the bells and gongs.

These boxes are of cast iron, cottage shaped, with combination locks, and each box is provided with its distinctive number. Every box contains the necessary mechanism, operated by clock work, the motor power of which is a weight or spring, to open and close an electric circuit a definite number of times and at certain intervals, in such a manner as to indicate, by the number of blows upon the alarm bells and the intervals between, the exact number of the box from which an alarm originates.

This mechanism is set in motion by the mere pulling down of a brass hook or knob, which is plainly visible on opening the outer door of the box—and this action is all that is necessary to create an alarm of fire. So perfect is this mechanism that it is utterly impossible for any other than the correct signals to be transmitted, and when once started it can in no way be interfered with until it has performed its entire work.

These signal boxes are located at different points of a city, with a view of protecting the largest amounts of property, and are securely fastened to buildings or poles.

2d. The bell strikers, for sounding alarms upon large bells. These are properly termed electro-mechanical—the mechanism, which is operated by weight power, being held under check and control by an electro-magnetic escapement. By these machines the power is unlimited, giving the full tone of the heaviest bells.

It is not necessary that bells should be especially provided for fire alarm purposes where the telegraph is used, as the bell strikers can be attached and used with any school or church bell without in any way interfering with their ordinary use. In the city of Boston about fifty large bells are in use for fire alarm purposes, in connection with the fire telegraph, nearly all of which are church and school bells.

3d. The electro-mechanical gong strikers, for engine houses, by which alarms are given sufficiently loud to awaken the members of a fire department, if asleep in their quarters. These gong strikers are operated upon the principle of using electricity simply to control mechanical power.

Two sizes are furnished—one with a gong fifteen or more inches in diameter, for engine and hose houses, the other with a gong six or seven inches diameter, for engine and fire commissioners, for use in their residences or places of business.

4th. The automatic repeater.—This instrument, which is located, with all the batteries used, at some central point, is really the heart of our automatic system of fire telegraph. Its use permits the distribution of the signal boxes, gong and bell strikers, upon a number of lines or circuits, depending upon the size of the city, and so arranged that a break or interruption of any one will not impair the efficiency of the others.

Through this instrument an alarm coming from a box on one of the lines is automatically repeated to all the apparatus on the other circuits, thus dispensing with the services of operators and watchmen, and a portion of only one

man's time is required to keep an entire system in order.

In case a battery becomes too weak to work efficiently, or an intentional or accidental interruption occurs to any part of the wire, in an instant notice is given by one blow upon all the alarm bells and gongs, calling attention to its temporarily disabled condition; thus not only keeping watch over the city, but actually watching itself, and guaranteeing reliability every moment.

In several of the larger cities, as Milwaukee, Newark, &c., the systems are most successfully worked by the chief engineers of the respective fire departments without conflicting with their other duties.

The signal boxes, gong and bell strikers described above, are connected with the battery and automatic repeater by wires, which are securely fastened upon the tops of the highest buildings or upon poles.

HOW AN ALARM IS GIVEN.

We will suppose a fire breaks out in a city where the automatic system of fire telegraph is in use—the person who first discovers the fire runs to the nearest signal box, and obtaining a key, which is easily accessible, he opens the outer door of the box and pulls down the brass hook, which is plainly in sight, once only, and lets go. Before he can turn his back upon the box its clock work is in motion, and an alarm is being sounded upon the little bells in every signal box, the gongs in the engine houses, and upon the large tower bells. Suppose the hook of box twenty-one has been pulled, the blows upon the bells and gongs will be given thus: 1-1 (two blows), then a pause of five or six seconds, and then 1, making 21, and this is repeated five times. If this is not considered sufficient another pull of the hook will give the alarm five times more. Now the localities of all the boxes being well understood by the firemen, they run directly to that box from which the alarm originates, and no time is lost in hunting for the fire.

THE CENTRAL OFFICE SYSTEM.

This system differs from the automatic in that all alarms from the signal stations are transmitted no farther than a central station, where operators who are on duty day and night receive the signals and set the apparatus in motion, which repeats the alarms upon the bells and gongs.

It is only in the very largest cities, where a very large number of instruments and a great amount of wire is in use, that the central office system is needed.

ADVANTAGES CLAIMED FOR THE FIRE ALARM TELEGRAPH.

It furnishes to every property holder the means near at hand, in case of fire, of giving an instantaneous and definite alarm, and this means the saving of thousands of dollars in property, and even of human life. It saves the first ten, twenty or thirty minutes' time after the discovery of a fire, which is inevitably lost where the ordinary means of creating an alarm is relied upon. It is the cheapest insurance which property holders can secure upon their buildings.

It is the only insurance which a city, in its corporate capacity, can place upon the property generally from which its revenue is derived in the shape of taxes. Every building in a city pays a certain amount in taxes into the city treasury. If burned or destroyed, so far as the city is concerned, it is a source of revenue gone. This consideration alone should induce city governments to spare no means or reasonable expense to prevent conflagrations.

It saves all and more than its running expenses, through the almost entire suppression of false alarms and unnecessary wear and tear of the fire apparatus incident thereto.

It saves the necessity of turning out an entire fire department at every alarm of fire. That portion of the department only which is nearest the signal box from which an alarm is sounded need respond. In every signal box there is a telegraphic signal key, by the use of which the chief engineer or his assistants can summon an additional force if they deem it necessary.

In case of riot, by the use of a code of signals which has been agreed upon, it may be used by the police to summons assistance.

It is very important to property holders, as affording them prompt information, day or night, of the locality of a fire, so that they may know whether or not any of their own property is in danger.

It may be used to establish standard time throughout a city. With an instrument placed at any point where correct time is kept, and properly connected with the telegraph, the alarm bells may be sounded at mid-day, or at any hour desired. This not only furnishes correct time, but serves to test the working condition of the telegraph, and insures its integrity.

The use of the fire alarm telegraph renders the employment of a large number of steam fire engines unnecessary. The reason of this is apparent: a small number of engines will be worked much more effectively in the early stages of a fire than a larger number after the fire is well under way. Quite a number of cities have avoided the necessity of adding to their fire apparatus by introducing the fire alarm telegraph, at much less expense than inevitably attends the purchase of a single steamer.

An independent wire may be run between the chief engineer's and all the engine, hose and ladder houses, connecting signal instruments for the transmission of orders and general communications. While the use of this "talking circuit" in no way affects the alarm circuit, yet all alarms of fire are repeated upon it; or, in other words, an alarm of fire is not only sounded upon the engine house gongs, but is repeated upon the small call bells connected with the talking circuit—thus affording a double system of alarms.

Finally, it secures the reliability, vigilance, efficiency and discipline of the fire department. But, after all, the best evidence of its great value is in these facts, that it is now in actual operation in 56 cities of the United States and

Canada, and in process of construction in several others, and that in no single instance has its use ever been abandoned or even temporarily given up.

The following named cities are referred to: Albany, N. Y., Allegheny, Pa., Boston, Mass., Buffalo, N. Y., Baltimore, Md., Bridgeport, Ct., Chicago, Ill., Cincinnati, Ohio, Columbus, Ohio, Cambridge, Mass., Charlestown, Mass., Covington, Ky., Detroit, Mich., Dayton, Ohio, Elizabeth, N. J., Fall River, Mass., Fitchburg, Mass., Hartford, Ct., Indianapolis, Ind., Jersey City, N. J., Louisville, Ky., Lawrence, Mass., Lynn, Mass., Mobile, Ala., Montreal, Canada, Milwaukee, Wis., Manchester, N. H., Newport, Ky., New York City, New Bedford, Mass., New Orleans, La., New Haven, Ct., Newark, N. J., Omaha, Neb., Philadelphia, Pa., Pittsburgh, Pa., Portland, Me., Peoria, Ill., Providence, R. I., Quebec, Canada, Rochester, N. Y., Richmond, Va., St. Louis, Mo., St. John, N. B., Springfield, Mass., San Francisco, Cal., Savannah, Ga., Syracuse, N. Y., Taunton, Mass., Troy, N. Y., Terre Haute, Ind., Toledo, Ohio, Toronto, Canada, Washington, D. C., Worcester, Mass.

COST OF INTRODUCTION.

The running expenses of the automatic system is a mere nominal matter—a few hundred dollars a year. The cost of construction will, of course, depend upon the amount of apparatus required, and the extent of territory to be covered; but every town or city possessing a steam fire engine can afford to have the fire telegraph—in fact, cannot afford to be without it.

It can be secured by cities of from 10,000 to 20,000 inhabitants for from \$5000 to \$15,000.

According to the New York Bulletin the hazards of fire are nearly eight times greater in this country than they are on the Continent of Europe. While, for instance, the loss of the stock fire companies in Prussia averaged 12½ cents per \$100, those in the United States averaged 83½ cents. The yearly loss of fire here being calculated at \$75,000,000, it follows that if as much security could be attained as there is in Prussia, we should effect an annual saving of \$60,000,000. Shoddy in architecture doesn't pay any more than it does in clothing—or politics.

Special Notices.

AGENTS WANTED.

SPECIAL INDUCEMENTS.

We want a first-class agent in every country in the United States, and also in Europe, to sell the world-renowned Wilson Sewing Machine, and the Wilson Manufacturing Machines, to whom we are prepared to offer Extraordinary Inducements. For full particulars, apply to address Wilson Sewing Machine Co., 827 & 829 Broadway, N. Y. Special Inducements to Exporters.

NOTICE

Is hereby given that goods for the exhibition at Diodjakarta, Dutch East Indies, (see The Iron Age, Nov. 12, first editorial) will still be in time if shipped by steamer Rotterdam, December 24th.

L. W. MORRIS, Agent,
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An iron worker of large experience in this country and Europe, and with the best testimonials as to character and capacity, wishes an engagement as manager or foreman of a mill or forge. Has had 20 years' experience in the manufacture of bars, hoops, plates, sheets, and puddle steel.

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By a Manufacturing Company located in Connecticut, within 40 miles of New York. He should be experienced in general machine shop practice, preferably in the production of light work by special machinery, and, above all, a competent manager of men and works. A person of good education, somewhat acquainted with office work, is greatly preferred. Present salary from \$1800 to \$2400, according to ability. Position permanent if satisfactorily filled. Address, stating past experience, references, etc., "E. N. W.,"
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Hardware Merchants.

We can supply you with strong pine dressed packing boxes, suited for packing shelf hardware, at half the price of new boxes, in lots of one, to three or four hundred at a time. We have various sizes, and are as good as new.

Wilson Sewing Machine Co.,
827 & 829 Broadway, N. Y.

Manufacturers Attention.

LABOR TO HIRE.

Wanted to hire out, the labor of 250 convicts in the Missouri State Penitentiary. Two Shops, 150 by 50 feet each, with main Shafing and Pulleys in Shop, with all the Steam Power needed. The finest open-air material, Handles and Hames Manufacture. Any portion of the above hands will be hired.

Also, a first-class opportunity for parties to engage in the manufacture of Men's Boots and Shoes, or Agricultural Implements. Ample shop room. Timber of all kinds very abundant. Correspondence solicited.

Address, HUGH L. FOX,
Treasurer St. Louis Mfg. Co.,
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Capital - - \$6,000,000, Gold.

Surplus - - \$1,800,000, Gold.

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SCALE: First 3 lines, 3/4; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

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Tenders Invited,

Separately or together, for Iron and Spikes required in the construction of a large Propeller for the Lake trade.
Delivered on cars at Pittsburgh, Buffalo, Detroit or Toronto.

W. Kough, Hardware Merchant,
OWEN SOUND, ONTARIO, CANADA, Nov. 12, 1874.

Merchant Iron or Nails

Wanted in exchange for 300 tons No. 1 Wrought Scrap Iron.

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A young man of twelve years' business experience, wishes to engage in

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by the 1st of January, 1875, in an established Hardware business, who can put in from \$20,000 to \$25,000, either cash, or stock suitable for jobbing trade.

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FOR SALE in the best business part of Jersey City, a first-class Tool and Hardware business. Established about 25 years, and doing a fair business.

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SPECIAL NOTICE.

I have three patents for Dies, Machinery, and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1865; January 31, 1866, and July 3, 1866. There is a special claim on each of the Dies. All persons infringing on said patents will be held responsible to the extent of the law.

Russell Jennings,
DEEP RIVER, CONN., Sept. 7, 1874.

Fletcher's Blast Furnace Co.,

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CHARCOAL PIG IRON.

Exclusively from New Bed Pure Magnetic Ore, suitable for Bessemer, Malleable and Cast Iron purposes, or for foundry use where very soft and strong iron is required.

Analysis of Average New Bed Pure Ore.	Analysis of No. 1 Bessemer Pig.
Metallic iron..... 68.240	Underestimated matter and loss..... 134
Oxygen with iron 26.010	Silicon..... 1.019
Water..... .380	Carbon..... 3.821
Insoluble silicious matter..... 4.320	Phosphorus..... .008
Sulphur, practically none	Sulphur, practically none
Phosphorus..... .008	Calcium..... .140
Alumina..... .280	Metallic iron..... 94.838
Lime..... .140	
Underestimated matter and loss..... .592	100.000
100.000	

Witherbee & Fletcher,

Port Henry, Essex Co., N. Y.
Furnace at FLETCHERVILLE, near Mineville, N. Y.

J. M. WHITE,

Architect and Constructor of Charcoal Blast Furnaces. Plans, Specifications and Estimates of construction furnished upon application.

Office address,

FON DU LAC, WIS.

A. PURVES & SON,

Corner South & Penn Streets, Phila.,
Dealers in
Scrap Iron & Metals, Machinery, Tools, Shafing & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Habbit Metals, Foundry Facings. Best Quality Ingot Brass. Cash paid for all kinds of Metals and Tools.

McHaffie Direct Steel Castings Co.

STEEL CASTINGS.

Solid and Homogeneous, guaranteed to stand a Tensile strain of 25 tons per square inch. An invaluable substitute for expensive WROUGHT IRON FORGINGS for iron Castings, where great strength is required. Office, cor. Keweenaw & Leavitt Sts., PHILADELPHIA.

Send for Circular and Price List.

Wanted.

A situation as bookkeeper or cashier of an iron works, a hardware business, or in the coal trade, which the advertiser understands in all its branches. Highest references of character, capacity, &c.

Address, H. D.,
Office of The Iron Age, 10 Warren St., N. Y.

For Sale.

For Sale or Rent on Easy Terms

A four story brick factory 46x50 ft. with unfailing water power of about 25 horse-power, auxiliary steam engine of 20 horse-power. Adjoining are office, barn and other outbuildings. Situated near depots of three railways, and lines of boats to New York and Philadelphia. Every facility for manufacturing and getting goods to market at cheapest rates. Apply in person or by letter to either

JOSEPH W. ALSOP,
ROBERT N. JACKSON, } Executors.
CHARLES E. JACKSON,
Middletown, Conn.

For Sale, &c.

Hardware Business For Sale,

In Denver, Colorado.

The stock and trade of an old established house, favorably known throughout the Territory. Stock clean and in good order. Trade large. Long continued illness of proprietor, sole reason of sale.

Address, JOHN HARPER,
Denver, Col.

WHITE & ERLING,

Manufacturers of

Pressed and Japanned TIN WARE,

Milwaukee, - - Wis.

Solicit correspondence from parties having Tinners' Specialties and Goods in our line of manufacture to sell. A large acquaintance with the trade of the Northwest makes us desirable mediums for manufacturers and inventors for introducing and selling their goods in connection with our own.

WM. E. TANNER & CO., Metropolitan Works.

Manufacturers of

Steam Engines, Boilers and other MACHINERY,

Canal St., from 6th to 7th, Richmond, Va.

In addition to a full line of new engines, boilers, saw mills, and other machinery of our own manufacture, we have now on hand and will sell at the lowest rates, the following lot of second-hand machinery, viz.: 3 Double Hoisting Engines, suitable for mining, tunneling or other purposes. Each of these engines has two cylinders, 7½ in. diam. by 18 in. stroke; two drums, 4 ft. diam. by 4 ft. long; geared to engine in proportion of 8 to 1, and are provided with disconnecting gear and friction brakes.

One 150 Horse-Power Stationary Engine, with heavy fly wheel, all complete, and nearly as good as new.

Three Return Tubular Boilers, 20 three inch tubes each, 15 feet long, complete with steam drum, fronts, valves, grates, &c., suitable for the above engine.

One 10 Horse-Power Portable Engine of our own make, complete, with two driving pulleys, "Judson" governor, &c., nearly new, and in excellent order.

One 30 Horse-Power Portable Engine, with circular saw mill, saw and belt complete. In first rate order.

Three 4 Horse-Power Stationary Engines. Cylinder, 4 in. by 10 in.

One 30 Horse-Power Stationary Engine, as good as new, complete, with "Judson" governor, fly wheel, &c.

One 30 Horse-Power Stationary Engine, in good running order, but not as new as the above.

One 16 Horse-Power Stationary Engine, with new vertical boiler.

One 60 Horse-Power Stationary Engine, in good order.

Two Fine Boilers, 26 ft. long, 42 in. diam., each with two 14 in. flues, iron front, grates, &c., in good order.

One Flue boiler, 34 ft. long, 48 in. diam., with two 14 in. flues, about as good as new.

One 7 Horse Portable Engine, of our own make, used only a few months, and in perfect order.

Two No. 6 Sturtevant Blowers. Two No. 4 McKenzie Blowers. One No. 6 Andrew's Centrifugal Pump. One No. 6 Turbine Centrifugal Pump. Three No. 6 Cameron Pumps. One No. 2 Cameron Pump. One Knowles' Pump. One Earle Pump.

Thirty Brass Tubes, 1½ in. diam., 12½ ft. long.

Send for illustrated catalogue and Price Lists.

LOWE & THOMASSON,

Chattanooga, Tenn., Dealers in

MINERAL LANDS.

Surveys Made and Titles Investigated. Parties desiring information or wishing to purchase ore or coal lands within the States of Tennessee, Alabama or Georgia, are respectfully requested to communicate.

We have For Sale Very Cheap

Two of the

Finest Charcoal Properties

in America. Brown Hematite Ore, 56 per cent. Metallic Iron, and less than 1-20th of 1 per cent. of Phosphorus. Cast Iron can be made for \$16 per ton. Also, 6400 Acres Bituminous Coal Lands, for which part payment will be taken in Northern Pacific R. R. Bonds.

Office of THE IRON AGE.
TUESDAY EVENING, NOV. 24, 1874.

U. S. Currency 6's.....	119	119A
U. S. 6s 1981, reg.....	119 1/2	119 1/2
U. S. 6s 1981, cou.....	119 1/2	120 1/4
U. S. 1982, 5-20 reg.....	112 1/2	112 1/2
U. S. 5-20 1982, cou.....	112 1/2	112 1/2
U. S. 5-20 1982, reg.....	114	114 1/2
U. S. 5-20 1984, cou.....	114 1/2	114 1/2
U. S. 5-20 1985, reg.....	115 1/2	115 1/2
U. S. 5-20 1985, ccl.....	115 1/2	115 1/2
U. S. 5-20 1985, reg. new.....	118 1/2	118 1/2
U. S. 5-20 1985, cou.....	118 1/2	118 1/2
U. S. 5-20 1987, reg.....	119 1/2	119 1/2
U. S. 5-20 1987, cou.....	119 1/2	119 1/2
U. S. 5-20 1988, reg.....	119 1/2	119 1/2
U. S. 5-20 1988, cou.....	119 1/2	119 1/2
U. S. 10-10 reg.....	118	118 1/2
U. S. 10-10 cou.....	118 1/2	118 1/2
U. S. 1981, reg.....	113 1/2	113 1/2
U. S. 5s 1981, cou.....	113 1/2	114

	Highest	Lowest
N. Y. Cen. & Hudson Consolidated.....	301 3/4	101 3/4
Lake Shore.....	81 3/4	80 3/4
Rock Island.....	100 3/4	100 3/4
Del. Mar. & W. Va.....	100 3/4	100 3/4
Wabash.....	30 3/4	29 3/4
Harlem.....	131	131
Western Union Telegraph.....	80 3/4	80 3/4
Atlantic & Pacific Telegraph.....	19 3/4	19 3/4
Northwestern.....	61 3/4	60 3/4
Prof.....	61 3/4	60 3/4
Millwaukee & St. Paul.....	37 3/4	37 3/4
Preferred.....	57	57
Panama.....	115	115
Pacific Mail.....	417 1/2	44 1/2
Ind. & N. E.....	42 3/4	43 3/4
Ohio.....	32 3/4	33 3/4
Union Pacific.....	36 3/4	35 3/4
C. C. & Ind. Central.....	9 3/4	9 3/4
Atlantic and Pacific, Preferred.....	18 1/4	17 1/4
Stannibal & St. Joseph.....	34 3/4	34 3/4
Hennepin & St. Joseph, Prefd.....	34 3/4	34 3/4
Quicksilver.....	36 3/4	35 3/4
Quicksilver Prefd.....	49 3/4	42 3/4

The dullness mentioned in our last issue still prevails, and the city may be said to be free from the presence of country buyers; for business is being done is mainly through travelers and letter orders. No changes in prices of any importance have occurred during the week. A good deal of preparation is already in hand for next spring's trade, and we know of several lists which are under revision and will soon be ready for the press.

—●—
Thanksgiving Day.

—◆—
IRON.

Bar.—We still quote 2.8 cents per lb. for

Rails.—The fact that the sellers of Rails will not take paper, while the buyers cannot, as a rule, pay cash, makes transactions few, and cash buyers are receiving very low offers. We quote Welsh, \$48 @ \$50, gold, and American, \$50 @ \$55, at mill.

METALS.

Friday. Tin Plates have been dealt in to the extent of but 2000 boxes during the week, and close quiet but steady at the following unal-

up as much as 225 tons for the week, 75 of which on the spot, and the balance "to arrive" at 6½c. for Silesian Union, and 7½c. for W. H., gold. We quote the market firm at 6½c. at 7½c., gold. There has been no further raising of limits by either letter or telegraph, but the accounts are of an encouraging tenor. The navigation of the Elbe will soon be closed, and no more will be shipped from Hamburg till spring. While this is the case, the French mills, most of which use water-power, will soon be in the market the moment the rains set in, and the metal, as is usually the case, will then in all likelihood improve still further. These considerations have prevailed in the mind of consumers when they began buying so heavily this week. Sheet Zinc is scarce of the size, 9 by 36, which commands 8c., gold, while other sizes only bring 8½c., gold.

IMPORTATIONS.

COAL.

iron heel of oppression acutely in various ways, but more especially in shortened supplies, the cars being held back in the region, the state-

ber and December:

Lehigh Washed Pea, \$4.00, f. o. b.
The Bituminous trade remains without

Mauch Chunk.....	245	4,857
Total	90,882	3,965,170

Same time last year.....	79,832	3,938,901
Increase	20,090	

OLD METALS, PAPER STOCK, &c.
The market for Old Metals, Paper Stock, Rags and other junk materials, has been very quiet during last week, and quotations re-

PITTSBURGH.

QUOTATIONS

This season of the year, orders are coming forward sparingly, and mainly for small lots, and while some of the mills have been obliged recently to drop from double to single turn, others are still running full. Manufacturers,

SCRAP IRON.—The Scrap trade, both in Iron and Steel, continues very dull, in sympathy with the general depression in the business, and there is not much prospect just now of an early change for the better. Prices are entirely nominal.

into with considerable warmth. The president stated that the manufacturers had submitted

The *Pittsburgh Commercial*, of the 21st inst., says: We have nothing of special importance to note in regard to raw Irons. Dealers being

100 tons gray forge	25 00—5 mos.
100 tons gray forge.	24 50—4 mos.
100 tons gray forge	24 50—4 mos.
100 tons gray forge	24 50—4 mos.

100 tons gray large.....	\$4.50—1 mo.
100 tons No. 2 foundry.....	\$6.50—cash.
100 tons white.....	\$2.50—4 mo.

10 tons white and mottled.....	23 00—4 mos.
10 tons No. 1 foundry.....	27 00—4 mos.
10 tons No. 2 foundry.....	25 50—4 mos.
CHARCOAL.	
10 tons No. 2 foundry, Lake Superior.....	\$33 00—4 mos.
50 tons foundry, Hanging Rock.....	private terms.
40 tons No. 1 foundry, Hanging Rock.....	\$34 00 @ \$35 00—4 mos.
20 tons No. 2 Lake Superior.....	34 00—4 mos.

tin has greatly augmented, and several advances have been noted. Spelter continues firm; business has, however, been limited, owing to the paucity of lots offering. Lead remains unaltered, the difficulty of placing orders being as great as ever.

Messrs. French & Smith's circular: "Copper.—A large consumptive demand during the past month has had the effect of considerably reducing available stocks, so that the monthly statistics show very favorably. The combined stocks here and abroad are now some 3000 tons less than at any time during the current year. This metal is attracting the attention of speculators, and for the last ten days transactions have been large at daily increasing values. We quote Chili bars, \$27; Wallaroo, \$26; tough, \$21; regulus, 17 per unit. Tin.—The price continued as at the beginning of October with but little variation until about a week since, when some considerable purchases, both spot and floating, especially of Australian, were made. As the quantity on the market was so much reduced, holders required higher rates, and when the stocks were made up, and it was found that the deliveries were larger than at any former period, it was impossible to buy, excepting at an advance of \$1 to \$2 per ton. Australian tin is now quoted 10 per ton lower than Straits. Tin plates.—There is improved demand for tin plates, and the works are getting more fully employed. Lead.—The smelters have great difficulty in making deliveries. The price is firm at \$23 to \$23.5. Spelter has advanced, and is quite firm at present quotations. Quick-silver is difficult to buy; a small parcel was sold at \$25 per bottle.

LATEST LIVERPOOL PRICES.

Iron: f. o. b. in Liverpool, per ton.

	£	s.	d.	£	s.	d.
Merchant bar	9	5	0	9	10	0
Merchant bar, in Wales	8	15	0	9	0	0
Staffordshire	10	0	0	10	0	0
Hoop	11	10	0	12	0	0
Sheet	13	0	0	14	0	0
Nail rod	10	5	0	10	15	0
Bar, best crown	10	0	0	10	10	0
Boiler plates	13	5	0	13	5	0

Tin Plates: f. o. b. in Liverpool, per box.

	£	s.	d.	£	s.	d.
Charcoal, I. C.	13	0	0	13	0	0
Coke, I. C.	1	7	0	1	10	0

Copper: Delivered in Liverpool, per ton.

	£	s.	d.	£	s.	d.
Bolt and Sheathing	100	0	0	100	0	0
Tin	93	0	0	93	0	0
Tough cake	93	0	0	93	0	0
Best selected	95	0	0	95	0	0

Meeting of Pig Iron Manufacturers.

At a meeting of a number of the pig iron manufacturers of the Lehigh Valley, held two weeks ago, the following conclusions were reached:

That the interests of those engaged in the manufacture of pig iron imperatively demands a further curtailment of production. To continue producing at the present rate, it was thought, is to invite and inflict on all engaged in the business serious loss, and on many certain financial ruin. It was agreed that all producers of pig iron ought at once to unite in mutual efforts to immediately reduce the output of the furnaces.

There can be no rational hope for any favorable reaction in prices, or in demand from consumers, before spring. Improvement will then, it is thought, be slow and gradual, even if our best hopes are realized. To go on, therefore, increasing the accumulation on the banks of the furnaces, it is feared, will tend to postpone and may wholly prevent such favorable reaction during next year.

To afford a living result at present cost of production, No. 1 Foundry should bring \$30, net, or furnace bank. There is good reason for believing that it would to-day command that price as readily as that now obtainable, but for the excess of production over demand for consumption. The present comparatively high price of Scotch pig would seem to warrant such a belief. The fact that sales of any magnitude can now only be made at a material loss to the producer, and this at a season of the year when demand is always greatest and prices usually highest, was thought to indicate that the demand for winter consumption would be small.

Those most experienced in the trade all agree in the opinion that we must now unite in effective efforts to immediately reduce the output of pig iron, or widespread disaster must result. All have a common interest at stake, and it is believed the future of the trade imperatively demands this action. Therefore, in furtherance of these views, a general meeting of the pig iron manufacturers of the Lehigh Valley, Schuylkill Valley, Upper and Lower Susquehanna, and of New Jersey, and such others as may attend, will be held at the rooms of the American Iron and Steel Association, No. 265 South Fourth street, Philadelphia, on Tuesday, Nov. 24th, 1874, at 10 o'clock a. m., to which you are respectfully invited.

It is earnestly to be hoped that a full attendance will result. Otherwise the meeting must fail of its aim. Those who previous engagements make it impossible for them to attend, should present their views to the meeting by letter.

In response to this call a meeting was held yesterday (Nov. 24th) at the rooms of the Iron and Steel Association, of which we have the following report:

(By Telegraph to the Iron Age.)

PHILADELPHIA, Nov. 24th, 1874.

To the Editor of the Iron Age.—A large meeting of pig iron manufacturers was held to-day at the rooms of the American Iron and Steel Association, Mr. G. Dawson Coleman in the chair, and Mr. Geo. W. Cope acting as Secretary. Among those present were Messrs. Wm. Harvey, C. S. Kaufman, Horace Brooks, James I. Bennett, Samuel J. Reeves, W. E. S. Baker, Percival Roberts, J. B. Moorhead, and others. Over thirty furnace companies were represented. A full and free exchange and comparison of views resulted in the adoption of the following resolutions.

Resolved, That it must be self-evident to all furnace owners, that the large reduction in the demand for consumption of pig iron imperatively demands a corresponding reduction in the amount produced, and that a continuance of the present over-production cannot fail to result in accomplishing the ruin of the trade.

Resolved, That it is the opinion of this meeting that an earnest effort ought to be immediately made to accomplish a reduction in the

make of pig iron, and with this object in view, a committee of seven be appointed to devise some plan to accomplish that end.

Resolved, That the chairman pro tem of the pig iron branch of the American Iron and Steel Association be requested to call a meeting of all the pig iron manufacturers of the country, at the rooms of the Association, on Thursday, December 10th, 1874, at eleven o'clock.

The committee of seven was constituted as follows: Wm. H. Alvery (?), C. S. Kaufman, G. Whitaker, J. B. Moorhead, G. D. Coleman, Horace Brooks and H. S. Eckert. The committee will meet at the rooms of the Association on the evening of Wednesday, the 9th of December, for further consultation, and on the following day they will present their plan for curtailing the production for the action of the meeting to assemble in accordance with the resolution above printed. The utmost harmony prevailed throughout the proceedings, and the opinion was unanimously expressed that nothing but the blowing out of a good part of the furnaces now in blast can avert worse disaster than has already overtaken the pig iron interest.

Blast Furnace and Rolling Mill Enterprise in Texas.

A company is now organizing in the town of Sherman, Texas, for the purpose of erecting a blast furnace and rolling mill, for the manufacture of pig iron, nails, &c. We take pleasure in laying before the public the inducements and advantages this company offers to capitalists and others seeking safe and paying investments. The deposit of ore this company proposes to work is found on a tract of land containing 400 acres, more or less, situated ten miles northeast of Sherman, Texas, three miles north of the Trans-Continental Railroad, six miles east of the Houston and Texas Central Railroad. Three kinds of ore are found on this land; the gray and the brown and red hematite ores.

Three different analyses, made from different samples of this ore, show the average yield of matte iron to be 39.54. This shows a much larger yield of iron than the majority of ores used in Pennsylvania. Her iron manufacturers have grown rich by working ores that only yield from 20 to 25, 27, 30, 35 and 37 per cent. But one deposit of ore in the State of Pennsylvania yields as much as 48 and 50 per cent.; that is known as Cornwall mountain.

The secretary of the company thus describes the plan of its intended operations:

For the development of this great source of wealth, we require energy and capital. We propose to organize a joint stock company, with a capital stock of \$225,000, for the purpose of erecting a blast furnace and rolling mill, for the manufacture of pig iron, nails, &c. We claim that pig iron and nails can be made at the following profits: \$225,000 would erect a blast furnace with a capacity of fifteen to eighteen tons per day, and a rolling mill with a capacity of 250 kegs of nails per day. Statistics show that this amount of nails would supply about one-seventh of the nails consumed in the State of Texas.

COST OF PRODUCTION, AND PROFITS.

Men of forty years' experience in the iron business who have examined this deposit of ore and its surroundings, say they can make pig iron for \$18 per ton; to be certain, say it will cost \$23, or \$5 more than they estimate. This pig iron (charcoal) is worth in St. Louis, \$36 per ton, showing a profit of \$13 per ton, or a profit of \$195 per day for the blast furnace. Now we propose to use this pig iron here; turn it over to the rolling mill at \$36 per ton. The mill rolls the 15 tons each day into bars and cuts it into nails. We will now see what they have accomplished at the end of each day. The pig iron cost \$36 per ton; say the loss is 200 pounds per ton, that would leave 1800 pounds, or make 18 kegs of nails, worth on an average \$4 per keg in St. Louis. Freight to any portion of Texas is \$1 per keg from St. Louis, consequently each keg would be worth \$5 here. That would make \$90 for each ton of iron so worked up, and shows a profit of \$54 per ton, or \$815 on 15 tons, on one day's work. This added to the profits of the furnace shows a profit of \$1005, less the labor, fuel and incidental expenses of running the rolling mill. We have made a calculation in regard to the cost of labor, fuel, etc., which, at a liberal estimate, cannot exceed \$400 per day, leaving \$605 as a daily profit on the investment, or a clear annual profit of \$180,365.

SURROUNDINGS.

With such a deposit of wealth in our very midst, what more could we ask? Every element necessary to make pig iron, nails, castings of all kinds, is contained on this same ground. Limestone of a superior quality, necessary for the flux, is found in large quantities immediately under a portion of the red hematite ore, and inexhaustible quantities could be had within two or three hundred yards of the probable location of the furnace. Sandstone is also found close by, suitable for the furnace. Timber—the entire tract is covered with heavy timber, principally post oak and hickory, as well as the surrounding country, for ten or fifteen miles, guaranteeing a sufficiency of timber to make charcoal to run a blast furnace and rolling mill for fifty years. Four never failing springs are on this land; either of them would furnish water enough for steam purposes. The Choctaw Creek, a never failing stream, runs along two sides of this land.

The quality of ores on this land will, with a proper mixture, make Bessemer steel rails, car wheels, or anything else made from iron ore. The reason we selected nails as an illustration is that they are used by everybody; are as staple as gold, and always command a ready market. The long lines of transportation to this country will always be necessitated to charge high rates of freight, as they are doing. Labor is as cheap here as in any manufacturing

district we know anything about. The best of colored labor can be procured here for one dollar per day. Subsistence of all kinds is equally as cheap, consequently our facilities for making cheap iron are equal to any iron field in America. Nowhere are there more favorable inducements held out to the capitalists than here in this enterprise, in the development of our iron interest, and the future of our great State of Texas.

Lake Superior Iron and Copper.

The following figures, taken from the Marquette Mining Journal, show the iron and copper shipments for the season ended Nov. 12th, 1874:

ORE.	
Cleveland	88,327
Lake Superior	75,579
Champion	46,536
Washington	23,186
Republic	112,647
Keystone	3,059
Kioman	31,739
Total	411,225

PIG IRON.	
Mich. Iron Co.	8,284
Morgan Furnace	5,878
Bancroft	3,361
Champion	7,327
Grac	4,037
Total	31,794

SHIPPED LAST WEEK.	
Iron ore	5,382
Pig iron	288
Total	5,670

GRAND ISLAND.

The following are the shipments, in gross tons, of pig iron, from the Grand Island furnaces this season, up to November 12:

Bay Furnace	7,068
Munising Furnace	5,113
Total	12,181

The following table exhibits, in gross tons, the shipments from Escanaba for this season, up to and including November 11, 1874:

ORE.	
Jackson	82,187
New York	54,029
Cleveland	6,336
Lake Superior	26,456
Champion	36,462
Washington	7,327
Winthrop	1,336
Saginaw	39,529
Total	273,331

PIG IRON.	
Pioneer Furnace	3,950
Escanaba Furnace	4,133
Dyer Lake Furnace	3,470
Total	11,553

Total ore and pig iron 285,514

AMOUNT SHIPPED LAST TWO WEEKS.

Iron ore	16,033
Pig iron	1,037
Total	17,070

The following shows the amount, in gross tons, of ore shipments from the port of L'Anse for this season, up to Nov. 11, 1874:

ORE.	
Spurr Mountain	41,607
Michigan	44,001
Total	85,608

THE DISTRICT.

The following will show the total shipments, in gross tons, from the Lake Superior iron district for the season of 1874, up to November 11, and shipments to a corresponding date last year:

IRON ORE.	
From Marquette	514,589
From Escanaba	469,894
From L'Anse	74,411
Total	1,058,893

PIG IRON.	
From Marquette	23,492
From Escanaba	8,618
From Grand Island	12,181
Total	44,291

Showing a total of 818,320 tons of ore and pig iron this season, against a total of 1,089,034 tons for a corresponding period last year—a decrease of 270,713 tons.

COPPER.—PORTAGE LAKE.

The following shows the total shipment of each mine, in gross tons, by the Union Steamboat Line, since opening of navigation:

REFINED COPPER.	
	Tons.
Galumet and Hecla	9,207
Oscoda	235
Atlantic	76
R. Uren & Co., Franklin	49
R. Uren & Co., Franklin	49
Pewabic	66
Isle Royale	61
Pewabic	133
Franklin	79
Concord Pewabic	2
Schoolcraft	5
Houghton	63
Hancock	5
Alouez	158
Total	10,294

MINERAL.	
	Tons.
Quincy	1,330
Atlantic	425
Quincy Tributary Company	20
Total	1,775

The following table shows the total shipments of mineral from Keweenaw county, since the opening of navigation up to October 19, 1874:

MINE.	
	Tons.
Copper Falls	565
Central	818
Cliff	605
Phenix	707
Delaware	49
Peterick	51
Amygdaloid	12
St. Clair	3
Alouez	115
Total	3,116

Construction of Foundries.

At the opening of the session of the Cleveland Iron Trade Foremen's Association, the president, Mr. J. M. Oubridge, after some useful remarks on the position which employers of labor ought to assume with regard to the above association, gave an excellent address on the "Construction of Foundries, and the Need of more Mechanical Appliances therein," from which we abstract the following:

Having had considerable experience in either patching up old foundries, or in building new ones, the subject was not unfamiliar to him. The subject was also large, but he would condense his ideas as much as possible. In the

first place, in commencing to build a foundry, due regard should be paid both as to its external and internal arrangements. Many people appeared to think that so long as they got the shell of a foundry constructed, and sufficient space inside it in which to make molds, that that was all that was requisite for a molder. The latter was afterward expected to make anything that was wanted. Even this shell must not cost too much money. Such reasoning was a great mistake. The external requirements of a foundry were very great, and a very considerable amount of plant was essential, and so the numerous filaments and appliances which had to be used at intervals and then put on one side, demanded much outside room, with easy access to them. Room enables the operations to be carried on with rapidly and at little cost. Again, the large amount of materials that are required should be deposited in convenient places, so that when wanted they could be obtained with the least amount of labor. Where there were materials to be often removed by laborers, with little facility for doing it, great expense followed. That kind of thing, indeed, it was that "ate the works up," for the payment for unskilled labor was one of the most serious items that stood against a foundry. He thought that no better system could be found than that of Sir Joseph Paxton for building the Exhibition of 1851, namely, setting out the work upon columns at a uniform distance from each other. In this way each four columns was complete as a set, and such a building could be readily made of any extent, either at once in the original design, or by subsequent extension, as circumstances required. This would obviate the awkward kind of patchwork not unfrequently seen in making additions to foundries. In the arrangements for what he deemed a good foundry, sufficient ground space would be needed. That space need not, however, be all built over at once. One-fourth portion of the building might be completed in itself, and additions made as increasing work required; still, uniformity would be preserved. He proposed to use steam traveling cranes, carried on the columns which also support the roof. The cranes themselves should be made to run out at the ends of the foundry, so as to convey all material lifted by them directly out of or into it at the least possible expenditure of time and labor. Small jib cranes should be attached to the same columns for light local lifting power. The space between the columns and the inner wall could be utilized for light work, and that between the outer and inner walls might be used for the purposes of drying stoves, engine houses, loam mills, and store sheds. Hydraulic or other mechanical arrangements should be applied so as to raise all the coke and iron to the charging stage of the cupolas direct. This would avoid the employment of much manual labor. All kinds of rubbish ought to be deposited in trucks at once, without having to be filled into them by hand. Such arrangements could be made either by having the trucks underground and using the cupola lift to raise them, or by erecting a gangway, whereby all would be barrowed in direct. He strongly recommended the adoption of the drop bottom principle for the cupolas, and the application of the three tapers system to them. Such was a general outline of what he would propose, and he hoped that if any one among his auditors were to be entrusted with the erection of a large foundry, his observations might not be unprofitable to that person.

Domestic Boilers.

In the last monthly report, the Chief Engineer of the Manchester Users' Association, Mr. Fletcher, directs attention to the importance of having boilers at hotels, clubs, and other public institutions periodically inspected. He says: "In addition to the explosions reported above, arising from boilers employed for steam-power purposes, it may be of interest to give the particulars of an explosion due to the bursting of a household circulating boiler, which occurred at a West-end club in London, at about twelve o'clock noon on Friday, October 9th.

"This boiler, which was placed at the back of a kitchen range, was of wrought iron, and of the ordinary circulating class, connected by two circulating pipes to a cistern above. Between the boiler and the overhead cistern were two stop taps, one in the upcast pipe, the other in the downcast pipe. At the front of the boiler was a small hand hole for cleaning out, and as the joint at the cover of this hole had been leaking, a mechanic was sent for to set matters to rights. On examining the boiler he shut off the taps between it and the cistern, it is presumed to stop the leakage until the joint could be set to rights, and then left the boiler with the taps closed, intending to return on the morrow to effect the repairs, taking the precaution, however, of passing over the range the following notice: 'This fire must not be lighted.' Unfortunately this notice was disregarded in his absence. The fire was lighted at about ten o'clock the next morning, and, as the outlets were both closed, the boiler burst in a little more than two hours from accumulated pressure, when the front was blown out and the range shot forward, one of the cooks being struck with the missiles, but fortunately not injured very severely.

"Had there been a safety valve in direct communication with the boiler this explosion would have been prevented. A drawing of a dead weight safety valve designed for such purposes was given in the association's printed report for January, 1867, and a number of these valves have since been applied. No circulating boiler should be allowed to work without an efficient safety valve, either of dead weight or other suitable construction fitted to it, more especially when there are stop taps between the boiler and the cistern.

"It is thought that the importance of having small boilers at hotels, clubs, and other public

institutions periodically inspected, has not been sufficiently estimated, and, therefore a few other cases, in some of which explosion has resulted, and in others in which it has been narrowly escaped, may be given.

"In one case, at a first-class hotel at the West-end of London, a kitchen boiler burst with very serious results through the stop taps in the circulating pipes being closed. The space around kitchen boilers is necessarily somewhat confined, and this, added to the fact that they are embedded in the fire, generally leads to considerable damage being done when an explosion occurs. In this case six persons were very seriously injured.

"In a second case, at a first-class West-end club, a small Cornish boiler, employed for driving an engine, was set at the back of a large kitchen range, the flues around the boiler being so cramped that inspection without removing some of the brick work was impossible. This boiler was enrolled with the association, and on the cramped character of the flues being pointed out, and the owners informed that the association could not guarantee the safety of the boiler without examination, they at once demanded the return of their subscription, and shortly after left the association. The bursting of this boiler in a crowded kitchen, packed behind the large range as just described, would have been most disastrous, and, occurring in the basement, might possibly have affected those who frequented the rooms above.

"In a third case, at another first-class West-end club, in which two boilers were placed in a cellar under the pavement of a public footway, one of the boilers had an unguarded man-hole, a weakness from which so many explosions have been found to arise. These boilers, like the preceding one, were enrolled with the association, and the danger arising from the weak unguarded man-hole was explained to the owners. The association's reports were referred to a practical boiler maker, and as he did not believe in the weakness of unguarded man-holes, though explosion after explosion has resulted from them, the boilers were withdrawn from inspection.

"In a fourth case, at a large hotel at an important railway junction, a small horizontal steam boiler, placed under the inspection of the association, was found on the first examination to have no pressure gauge, no glass water gauge, and no strengthening mouthpiece to the man-hole, while the float was very stiff and unreliable, and the safety valve nearly locked fast. Added to this the boiler was so wasted by corrosion that a thickness of only one-sixteenth of an inch remained, and the inspector knocked a hole through the plate with his hammer. On these defects being pointed out to the owners they acted more wisely than in the preceding cases, inasmuch as they at once condemned the old boiler and exchanged it for a new one.

"In a fifth case, at a large seaside hotel, two vertical boilers on the circulating principle, employed for heating the building, were found on examination to have stop taps in the circulating pipes, whereby all the pressure could be bottled up, while at the same time they had no safety valve. The bottom of one of the boilers over the fire was found to be grooving and bulging, while inside there was a thickness of 9 in. to 11 in. of sediment, which had been allowed to remain to stop the leakage. On the recommendation of the association, safety valves have since been applied and repairs effected.

"One other case met with during the past month may yet be referred to, which, though not occurring at an hotel or club, is nevertheless of a kindred character, the boiler having been employed at a place of public resort. The boiler in this case was of the portable multifurcular type, and had been left quit recently engaged in the erection of a large building in the very heart of one of our largest commercial centers. On examination by the association it was found to be in a most unsatisfactory condition. The fire-box had no roofing stays, and was bulged down. The safety valve, which was loaded by a spring balance, would be locked fast as soon as the spring was screwed down to a pressure of 54 lb. on the square inch, so that if the attendant had inadvertently run the lock nut down a few threads too far there would have been no outlet for the pressure. Several explosions have arisen under such circumstances. This boiler is now laid off, but the public, who were daily passing and repassing the spot where it was employed, have had a narrow escape.

"This list might be still further extended were it allowed to include laundry boilers at public institutions, and also boilers at lunatic asylums, &c., many of which have been found to be so wasted by corrosion as to be reduced to the thickness of paper, and on the very eve of explosion. Enough, however, has been said if this brief notice serves to show the importance, which it is thought has not hitherto been duly estimated, of having boilers at clubs and hotels, as well as at other places of general resort, put under the protection of periodical inspection in the interest of the public safety."

Carbonized Brass.—For the last eighteen months Mr. B. W. Baldwin, of this city, has been manufacturing an article which he calls "carbon bronze," or carbonized brass. This article has been in use by several prominent firms here, and has received a fair test in rolling mills and on railroads, for car machinery and other purposes where great durability is required of anti-friction metal. After 35 years of experience in the manipulation of copper and its alloys, with the assistance of Professor Weismann (metallurgist, late of Franklin Institute), the inventor succeeded, nearly two years ago, in establishing the theory of its mixture, and perfected and brought it into practical use. In casting it resembles gun metal, but its fibre is more compact and close, giving it great elastic resistance under heavy and repeated strains. In finishing, it receives a high degree of polish, it is perfectly homogeneous, and under a tool cuts easily and smoothly. There are two other advantages which this metal possesses, one is that it is cast in fine sand it is ready to go upon the bearings without being reamed or otherwise finished; another is that it will not cut the necks of rolls, car axles or journals. It casts remarkably sound, and when confined, as in a "housing," it will wear to a fine shaving, no lining with Babbitt metal being required. Messrs. Hutchinson & Co. are testing it in pump linings, as to its merits of resisting the action of sulphur water. The cost of this metal is about 15 per cent. less than gun metal.

A Visit to Coalbrookdale.

Coalbrookdale is very intimately associated with all that is interesting to dealers in iron and iron goods of almost every kind. Attracted, no doubt, as they usually were, by the outcropping of the ore and the abundance of timber, the Romans smelted iron there, and the tributaries of the Severn coming down the steep embankments of the neighborhood afforded motive power for the blast engines and the hammer.

That cutlery was made here even as far back as the beginning of the thirteenth century would seem to be indicated by the existence of an old tenure, dated 13th John, 1211, which showed that the tenant of the king at the More, within the jurisdiction of the Sheriot forest, held his land upon the condition that he appeared at the Exchequer on the feast of St. Michael yearly with a hazel rod of a year's growth and a cubit's length, and two knives (*cultellos*). The treasury and barons being present, the tenant (Mr. Randall informs us in his very interesting book entitled "Old Sports and Sportsmen"), was to attempt to sever the rod with one of the knives until the blade bent or broke.

The other knife was to be of a very different class, inasmuch as it was with one stroke to sever the hazel rod. The quality of the cutlery being thus established, this last knife was to be given up to the king's chamberlain for royal use. Why His Majesty should have desired to encourage the manufacture of inferior as well as first-class cutlery in Coalbrookdale is not quite clear. Were there Cheap Johns in those days? If so, perhaps, His Majesty had a notion of encouraging trade in "cheap and nasty." Of the origin of the tenure nothing is really known but it is supposed to have arisen out of some kingly peril or some other forest incident connected with the chase. Nevertheless, it is conclusive that cutlery was made in the Coalbrookdale district at least six and a half centuries ago. That iron was manufactured at a very early period in the heart of the forest of Sheriot and the Clee is shown by Leland, who informs us that in his day there were blow shops on the Brown Clee Hills in Shropshire, where iron ores were exposed upon the hillsides, and where, from the fact that wood was required for smelting, it is only reasonable to look for them. Historical records and monastic writings, as well, it will have been seen, as old tenures, together with traditions, and heaps of slag, tell us that iron had been manufactured in the midst of these woods from very remote periods.

There were predecessors of the present Coalbrookdale Company as far back as the reign of Henry VIII. Since that time the Dale is identified with almost every epoch in the history of iron manufacture and its adaptation to the requirements of modern life. Richard Ford, who married a daughter of Abraham Darby, and managed the works in 1747, was the first to successfully use at about that time raw coal in the process of iron smelting; and there were the brothers Crangie, foremen to Richard Reynolds, who succeeded the second Abraham Darby, that were the first in 1766 to use raw coal to make bar iron out of cast iron in a reverberatory furnace. The era of railroads, too, was fairly initiated at Coalbrookdale, when Reynolds replaced the wooden rails with rails of cast iron. It was to Abraham Darby the third to whom the world was indebted for the first iron bridge ever erected. The cast iron arch was prepared under the superintendence of Abraham Darby by Mr. Thomas Gregory, his foreman of pattern makers. The castings were made at the Coalbrookdale foundry, and the iron work was successfully erected in the course of three months. The bridge was opened for traffic in 1779, is sound at the present day, and has given rise to the thriving town of Ironbridge, on a spot which was previously a nameless part of the waste of the Manor of Madeley. Later on, Mr. John Wilkinson, when he launched the first iron barge, made Coalbrookdale the cradle of the iron shipbuilding trade.

What the Coalbrookdale Company have done in fine art metal work, the frequenter of either the 1851 or 1863 exhibitions well remembers; and every ironmonger is aware in how large a degree the concern contributes to the supplies of the market with first-class cast iron products for both use and ornament. When we visited the works a few days ago, we found all these in different stages of manufacture.

The antiquity of the concern was illustrated by a bar, dated 1685, of one of the old charcoal blast furnaces that once stood at Longwood. This, when the furnace was dismantled, had been preserved, and now stood parallel with the bar of a later furnace which had been erected on ground that is, at the present time, a casting shop. On this second bar was the date 1777. It had belonged to that furnace which was destroyed, with much other property, on the occasion of the land flood of the Dale, recorded in the "Philosophical Transactions" of the time, and respecting which much joy was manifested by the Darbys that though many thousand pounds worth of property had been lost, yet that there was no sacrifice of life. Nor has water-power been altogether abandoned at the Coalbrookdale Works. It was being used to actuate lathes and other working apparatus. Whilst, however, processes adopted by the able fellows who did so well and so bravely in devising means of manufacture without having precedent to guide them were being here and there continued, simply because further experience has not yet developed anything more perfect, still that which more extended knowledge and science has supplied we found here in complete operation, both in the early casting processes, and likewise in the later operations through which the hardwares had of necessity to pass. There was no part of the concern which did not seem to be in nearly full work, and we learned that this had been the case all through the recent depression. The

extent of the company's engagements is to be inferred from the fact that, including the pitmen, employment is afforded to some 3000 hands. It may here be said that, to secure an uninterrupted supply of fuel, a colliery in North Wales has lately been acquired by the company. This rendered the firm independent of the stoppage of local pits during the strike, not long since, of the colliers.

Very interesting was it to see the wares with which one is so familiar from day to day in their complete shape, in their embryo condition. Strangely weird, and reminding one somewhat of the remains in the Naples Museum of ancient Romans who fell beneath the Vesuvius lava storm which buried Pompeii and Herculaneum, were the limbs of a Naiad as they lay imbedded in the foundry mold, but which, when they have passed through the other stages awaiting them, will present an elegant and smoothly chiselled figure supporting a water fountain, hereafter to grace the demesne of a British noble. Clean and sharp, even when they left their foundry matrix, were the castings that will by-and-by find a place both within and without doors, to the delight and the comfort of both young and old of all social grades. Nor could we fail to be slightly admonished, as we presently saw some of them being worked up into tomb rings of different sizes and varied designs. One was not surprised to see how large had been the provision which was made for the manufacture of stove grates. The store of fire brick barks and sides would have required several of Wilkinson's iron barges to convey it up the river. Two dozen grinding stones required for brightening stove grates were kept going by a powerful vertical engine worked by expansion, and possessing all the modern improvements. Very numerous were the different classes of grates in course of manufacture, and ingenious the contrivances for economizing fuel and the application of tiles to the sides of grates for purposes of ornament and as reflectors. The newest grate in hand was that by Whitwell, somewhat upon the Captain Galton system of admitting cold and emitting hot air. It was small and compact, and it was claimed for it that it is much more economical of fuel than the Galton grate.

Electro-bronzing was being extensively applied. There is scarcely any kind of ornamental cast iron ware to which, indeed, it could not be adapted with great advantage. Upon nothing, however, was it observed with more gratification to the spectator than amongst the lighter class of articles—plates which can be used either for receiving address cards or for holding fruit. Quite new, however, was its application to devices of about the size of painted tiles for grates. There were two specimens at the works, each having a grouped device from an old master. The slabs were of iron, and the figures were brought up in bold relief and suitably bronzed. One slab, with a horse and his driver, after Albert Durer, was a delightful piece of art, and embraced an illustration of foreshortening which we have never seen surpassed. Such work and such designs might be adapted with striking effect to the sides of stove grates; but in nothing would they appear to greater advantage than in massive mantle pieces electro-bronzed. It did not appear that the Coalbrookdale Company have yet resolved to apply the medallions to any structure. At present those we have described are mere indications of what their designers and artificers are capable of in that branch of their fine art work.

In promoting the study of the fine arts and the sciences among their work people, the Coalbrookdale Company have an institute embracing, amongst other attractions, a school of art, and during our visit we inspected very creditable specimens of free hand and mechanical drawing by young fitters and other such workmen in the company's service. Here, too, it may be remarked that near to the institute there stood a noble church, which the company have put up for the religious education of their employes.

In conclusion, I may note that, whilst by keeping themselves abreast of their competitors in Scotland and elsewhere throughout their miscellaneous departments, the Coalbrookdale Company are able to keep their old customers and extend their connection, they seem to have a growing demand for massive machinery. This is to be inferred from the fact that a spacious new fitting shop is being put up. From what we observed in course of erection in this shop, it is clear that Mr. Norris, the manager, intends keeping abreast of the times in this department also. A planing machine was being laid down of the unusually large dimensions of 30 feet by 8 feet, with three tools to operate together on two sides and the top of the work. A radial drilling machine has likewise been erected in the same shop.—*The Ironmonger.*

Arrangements are being made to build a shop in Youngstown, O., for the construction of iron bridges.

London Metal Market.

(From The Mining Journal.)

Copper—7 ton.	£.	s.	d.	¢.
Best Selected.....	95	0	0	—
Tough Cake & Ties.....	93	0	0	—
Sheathing and Sheets.....	91	0	0	100 0 0
Bolts.....	100	0	0	108 0 0
Bottoms.....	100	0	0	—
Old.....	85	0	0	87 0 0
Australian.....	96	0	0	96 0 0
Wire.....	0	1	0	5
Tubes.....	0	1	2	0 1 3
Brass—7 ton.				
Sheets.....	0	0	9	—
Wire.....	0	0	9	—
Tubes.....	0	0	12	—
Yellow Metal Sheathing.....	0	0	8	—
Sheets.....	0	0	8	—
Spelter—7 ton.				
Foreign on the spot.....	24	0	0	24 5 0
" to arrive.....	23	15	0	24 0 0
Zinc—7 ton.				
In Sheets.....	31	0	0	31 0 0
Quicksilver—8 bottle.	25	0	0	21 0 0
Tin—7 ton.				
English Blocks.....	98	0	0	—
Ditto Bars (in bales).....	99	0	0	—
Ditto Refined.....	100	0	0	—
Banks.....	98	0	0	100 0 0
Australian.....	93	0	0	95 0 0
Tin Plates—7 box.				
IC Charcoal.....	1	16	0	—
IX ".....	2	0	0	—
IX ".....	1	15	0	—
IX ".....	2	0	0	—
IX Coke.....	1	6	6	1 9 0
IX ".....	12	6	6	1 16 0
Canada Plates.....	18	0	0	—
Iron—7 ton.				
Bars Welsh, in London.....	9	5	0	0
" to arrive.....	9	15	0	0
Nail Rods.....	11	0	0	11 0 0
Nail Rods, Staff'd in L'ndon.....	10	5	0	12 0 0
Bars.....	12	0	0	11 0 0
Hoops.....	10	0	0	11 0 0
Bars at Works.....	10	0	0	12 0 0
Rooms ditto.....	11	0	0	12 0 0
Sheets, single, and plates.....	12	0	0	13 0 0
Fig. No. 1, in Wales.....	2	0	0	6 10 0
Refined metal ditto.....	5	0	0	5 0 0
Bars, common ditto.....	4	5	0	8 10 0
Do, merchant, Type or Teer.....	4	0	0	7 5 0
Ditto, Swedish, in London.....	16	0	0	17 0 0
To arrive.....	17	5	0	12 0 0
Fig. No. 1, in Clyde.....	4	0	0	4 6 0
Ditto, E.A.B., Type or Teer.....	8	0	0	5 5 0
Ditto, Nos. 3, 4, L.O.B.....	8	0	0	14 0 0
Railway Chairs.....	12	0	0	10 0 0
Indian Cast Iron Pigs in L'ndon.....	8	0	0	—
Steel—7 ton.				
Swedish, in kegs (rolled).....	19	0	0	20 0 0
Ditto (hammered).....	19	0	0	—
Ditto, in forgings.....	19	0	0	24 0 0
English, sprags.....	19	0	0	—
Lead—7 ton.				
English Pig, common.....	23	10	0	—
Ditto, W.B.....	23	10	0	—
Ditto, Sheet.....	24	1	0	24 15 0
Ditto, Red Lead.....	24	15	0	25 0 0
Ditto, White.....	20	0	0	26 15 0
Ditto, Patent Shot.....	26	10	0	—
Spain.....	25	0	0	—
At the works, 1s. to 1s. 6d. per ton less. Turne plates 2s. per box below tin plates of similar brands. Add 6s. for each X.				

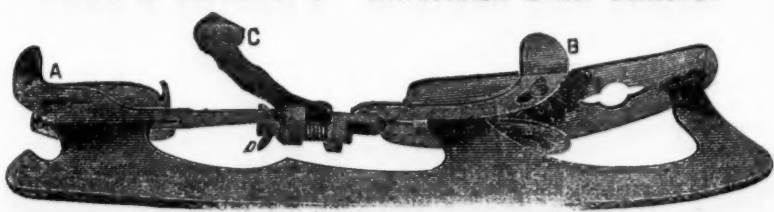


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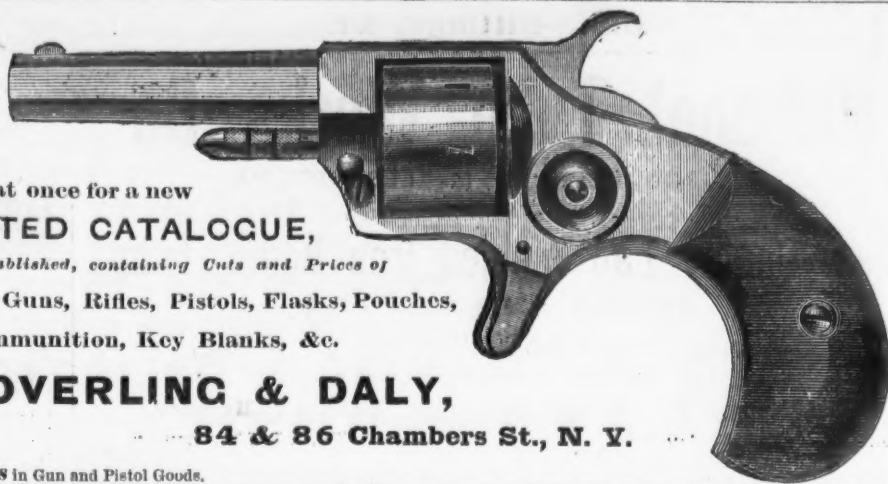


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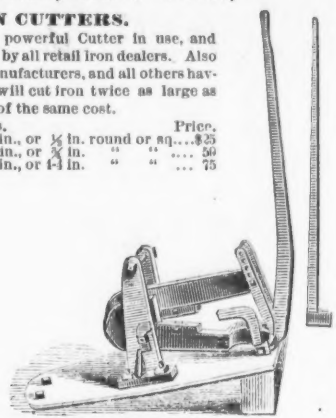
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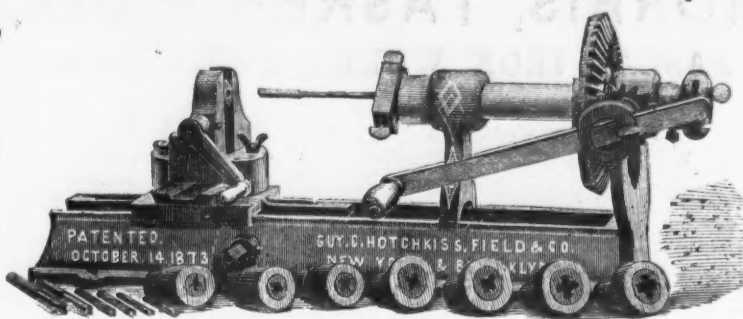
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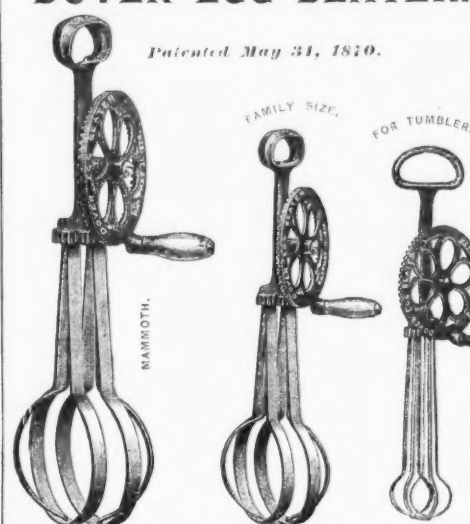
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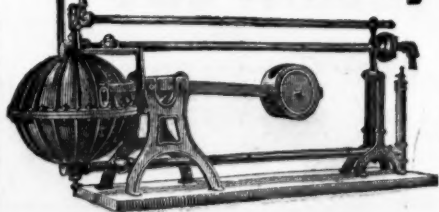
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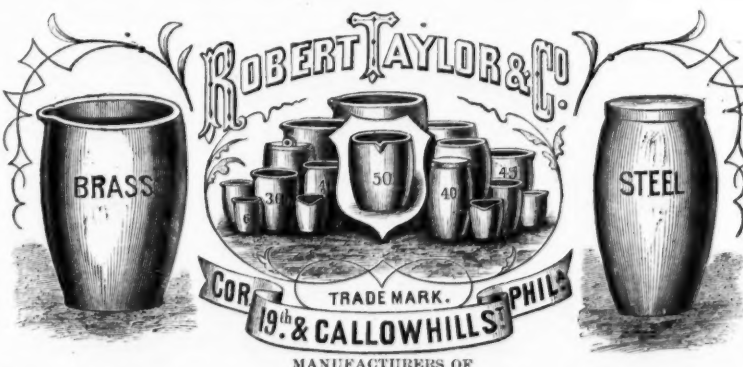
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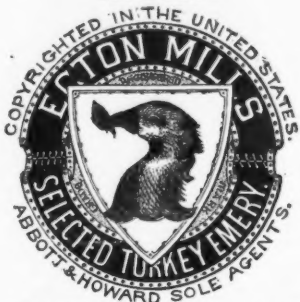
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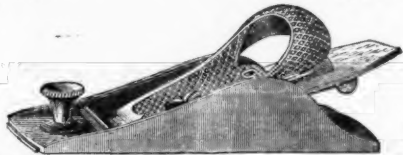
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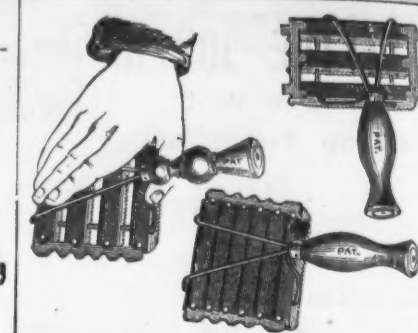
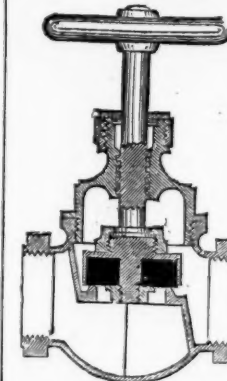
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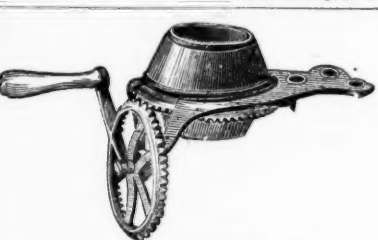
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AND MARBLE BUILDINGS

605 Seventh St. (Opposite U. S. Patent Office,
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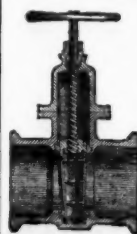
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PRINCIPAL OFFICES PHILADELPHIA.**Chapman Valve Mfg. Co.,****STEAM VALVES,**

Iron and Composition, of all sizes.

WATER and GAS Gates, 3 to 48 inches.

HYDRANTS.

Office and Warehouse, 75 & 77 Kilby St., Boston, Mass.

**TURNED MACHINE SCREWS,**

One-sixteenth to five-eighths diameter,

Heads and points to sample.

IRON, STEEL and BRASS.

Lyon & Fellows Mfg. Co.,

Cor. 1st and North 3d Streets, Williamsburgh, N. Y.

The Influence of Scarce Labor upon the Prices of English Hardware.

In not a few branches of the hardware industries all sorts of allurements are being held out by employers and managers to attract men. We do not say that they are dishonorable allurements. On the contrary, so far as we are aware, only that is being done which is most honorable. One master is not enticing away the men of another, though the high wages offered are without precedent in our experience. The offers, however, are hardly more than nugatory in their consequences. The smiths' hearths that in the past two months have been put out, and the benches which have been made tenantless, both alike by natural mortality, remain so still, and are likely to so remain. Do what they will employers cannot get hands enough. Those who need more smiths, or safe makers, or lock makers, or iron plate workers, or tin plate workers, cannot get them. There has been a change in situation now and again on the part of those who still are able to earn their bread; but there is hardly any new blood being infused into those industries.

The workmen in times past have carefully abstained from teaching youths, and this is the result—the evil grows with that it feeds on. As the men become scarce so the masters are less able to assert the authority which rightly attaches to their position. And there are few operatives who are patriotic enough to instruct boys. Much of this is the result of unionism; some of it is the result of past low wages. Higher remuneration would remove the difficulty in only a few branches.

Meantime, the reader will observe the effect upon prices which must inevitably proceed from this state of things. What other issue could be looked for when we have advertisements for such men as smiths accompanied with appeals like this: "Wages no consideration to a competent man," and when, as within our own knowledge, employers of artisans not more than usually clever with the file, and the hammer, and the drill, feel themselves so incapable of increasing their staff that, in order to provide against the loss which begins immediately to accrue upon the death of each workman, they have actually taken life interests in the men's existence!

We have pointed to one means whereby perhaps a little of this difficulty may be remedied; but nothing very effective will be done until masters make it to the interest of their men to train apprentices. We must revert to the old apprenticeship system. If we do not go back to the seven years' period, then we must take a shorter. Under certain restrictions, the boy must be the apprentice of the man, and not so much that of the master; and the man must have an immediate pecuniary interest in the labor of the boy. The man will then be foremost to seek the needed youthful labor; and will be sure to find it. By these means new blood will be infused into industries, but not by any means to the immediate easing of the prices of the commodities produced. If this system is not found practicable, then manufacturers of hardware must have a school of industry, where, under practical teachers, youths, and, if you like, adults, may come as students under professors at college, and there be taught any of the handicrafts in which there are teachers. We have thought much upon the question, and we are convinced that, with the advancing power of the operative classes, it is only in this way the difficulties of which hardware manufacturers are every month more and more complaining will be overcome. Unless we can increase the supply of skilled manual labor in not a few of the metalliferous branches, ironmongers will have to abandon all expectations of further ease in prices; indeed, they must think themselves happy if the tendency of higher wages, which necessitated a late advance, is not productive of similar consequences at no distant date.—*Ironmonger.*

The Himrod Furnaces.

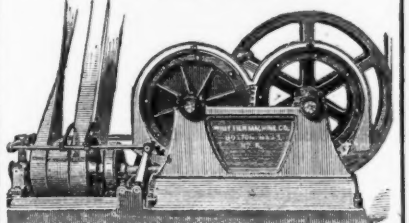
The Himrod Furnace Company, of Youngstown, Ohio, was organized and incorporated in 1859. The first furnace was completed and put in blast in the spring of 1860. Its dimensions were forty-five feet high and twelve feet bosh. This is known as furnace No. 1. It has since been rebuilt and enlarged until now it is forty-eight feet high and fourteen feet bosh, with bell or covered top. During the following year (1861) No. 2 furnace was erected with the same dimensions as No. 1. This furnace has also been rebuilt and enlarged to the present size of the first furnace. In 1868 the No. 3 furnace was erected. It was forty-eight feet high and thirteen feet bosh. Until a short time previous to the formation of this company only native ore had been used in the furnaces of the valley, but this company determined upon the experiment of using Lake Superior ore. Under the wise and efficient management of Mr. David Himrod the enterprise was a success from the outset. The first furnace turned out some twenty tons of iron per day, while previous to this time one hundred tons per week of iron of an inferior quality was deemed a remarkable yield for one furnace. To the Himrod Furnace Company belongs the credit of establishing the system of paying employees in cash. Before this time the various companies in the valley were accustomed to pay workmen with orders on stores, or scrip, but this company determined to inaugurate the payment of wages in money each month—the only true policy and the one now universally adopted. This company has from the first been eminently successful and prosperous. Its business reputation has been and is unrivalled. The officers of the company have invariably been men whose personal character alone was a sufficient guarantee to the public of its integrity and honor. None of the original stockholders are now living, except Mr. Himrod, and has retired from the company. Its present

ent officers are: president, R. A. Wight, of New York; treasurer and financial manager, A. B. Cornell of Youngstown; secretary, Robert Kelley, of New York. This company, together with Brown, Bonnell & Co., form the Mahoning Coal Company, and they therefore mine their own coal. About one hundred and fifty tons per day is consumed at the furnaces. Some sixty tons of pig iron is the average daily yield of these works, amounting to about 15,000 tons annually, worth in market, at \$30 per ton, \$450,000, which is the yearly business of the company here. The Himrod Furnace Company own some twenty-two acres of land situated west of Crab Creek, between the A. & G. W. and the A. Y. & P. R. R., and is occupied by the works of the company, switches, &c. At present but two of the furnaces are in blast. A large horizontal engine drives the bellows of No. 1 furnace. This engine has a 32½ inch cylinder, with six feet stroke, one of the best engines in the valley. No. 2 and 3 furnaces have each upright engines with 30 inch cylinders and 4 feet stroke. Two of the furnaces have Pollock hot blasts and one the Hamilton hot blast. One A. S. Cameron steam pump supplies the water lifts and what is needed for the tuyeres and about the works. A cast is made at each furnace once in eight hours. We are informed that 6 tons of coal, 4½ tons of Lake Superior ore, and 1½ tons of limestone used at these furnaces will produce three tons of pig iron. This proportion varies with the purity of the ore, quality of the coal, &c. The air before being blown into the furnaces is heated to about 1000° Fahrenheit, and it requires more pounds of hot air to make a ton of pig metal than of coal, ore and limestone combined. The products of these furnaces are nearly all consumed within the radius of one hundred miles. They are shipped to Pittsburgh and Cleveland, and sold to supply the iron manufacturers of the valley.

In the Centennial exhibition buildings at Philadelphia, 11,000,000 pounds of iron will be used, and there will be 175,000 square feet of glass needed. The flooring of the memorial building will be marble tile, and will require 75,000 square feet. The cost of the permanent Centennial building is to be \$1,199,273.

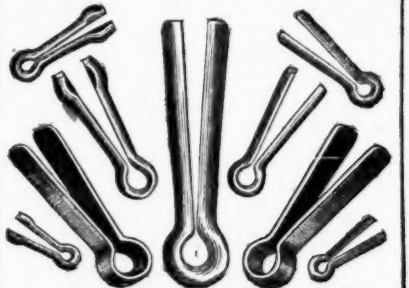
Whittier Machine Co.,
1176 Tremont St., Boston, Mass.
Manufacturers of

STEAM ENGINES, BOILERS, ELEVATORS and MACHINERY.



This Company has just received the highest award, a Gold Medal, for Safety Elevators, from the Massachusetts Charitable Mechanics Association.
CHARLES WHITTIER, Pres. **JAMES STURGIS, Pres.**

GEORGE BARNES & CO.,



Manufacturers, Syracuse, N. Y.

THE LONDON MFG. CO.
Copal Varnishes AND JAPANS.

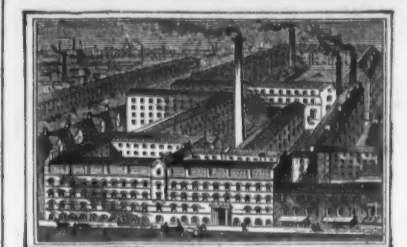
To Coach Makers, Hardware Manufacturers, Car Builders, And the Trade generally using **Varnishes & Japans.**

Aware of the impracticability of importing these articles at a price sufficiently cheap for use here, we take pleasure in stating that, aided by an extended experience in England, Canada and the United States, we are enabled to supply an article which, upon trial, will demonstrate its being EQUAL TO ANY English made, and unexcelled by any made in America, for its quick drying quality, as well as for its being durable and brilliant in color.

BRUNSWICK BLACK, (Self Drying.)
No. 1, \$1.50 per gal. No. 2, \$1.25 per gal.
The London Mfg. Co.,
in submitting the **DAZZLE BLACK BAKING JAPAN** (And their Japans generally)

would call the attention of Sewing Machine Companies, Lock Manufacturers, Japaners and other manufacturers using or handling Japans, to its peculiar qualities both as a preparing and finishing Japan. For the fine work of Sewing Machine Companies, Safe makers, and ornamental work of all description the Dazzle Black Baking Japans are highly desirable, both as an iron and wood Japan.

These Baking and Self Drying Japans contain No coal tar, coal gas nor deleterious substance, but are made from pure and unadulterated gums.
HYATT & CO., Proprietors.
Office, New York, 246 Grand St. Factory, Newark, N. J., 113 Chestnut St.



Manufacture of the Spencerian Steel Pens, Birmingham, England.

Spencerian Double Elastic STEEL PENS.

The superiority and excellence of these justly celebrated Pens are appreciated, as is shown in their constantly increasing sale. They are comprised in 15 numbers, of which one number alone has an annual sale of more than

5,000,000.

The Spencerian Pens are manufactured of the very best material by the most expert workmen in Europe, and are famous for their elasticity, durability and evenness of point.

The Spencerian Pens are For Sale by all Dealers.

We make Fifteen Numbers of Pens, differing in flexibility and fineness of point, adapted to every style of writing, as follows:

No. 1. College Pen. Point Fine; Action Perfect. This is a great favorite with our leading penmen, is largely used in the Schools and Commercial Colleges throughout the country, and gives better satisfaction than any Pen before the American Public.

No. 2. Counting-House Pen. Point Fine and Flexible, well adapted to the use of Correspondents and Accountants.

No. 3. Commercial Pen. Point Medium. An Easy Writing Business Pen.

No. 4. Ladies' Extra Pen. Point Extra Fine and Flexible. For delicate Fine Hand Writing this is a very superior Pen.

No. 5. School Pen. Point Fine, Medium in Flexibility. For a durable School Pen it has never been equalled.

No. 6. Flourishing Pen. Point Long, Flexible and Medium in Fineness. For Off-hand Flourishing.

No. 7. Quill Pen. Point Medium, Quill Action. A Smooth, Easy Writing Pen. Its name well represents its qualities.

No. 8. Congress Pen. (New.) Point Medium Flexible. A very superior Pen for all styles of writing. This Pen undergoes a process that renders it non-corrosive and three times more durable than any ordinary steel Pen.

No. 9. Bank Pen. Point Long and Flexible. A great favorite with Accountants, Tellers, &c.

No. 10. Custom-House Pen. Point Medium Well adapted to all styles of Bold Free-Hand Writing.

No. 11. Unrivalled Pen. Point Medium, very Smooth and Flexible. The action of this celebrated Pen is very fine.

No. 12. Epistolaire Pen. Point very Fine, and very Flexible. This is the Finest Pointed Pen made, and for very delicate Writing, Map and Fine Pen Drawing, it has no equal.

No. 13. Engraving Pen. Point Blunt and Smooth. Particularly adapted to Coarse-hand Writing and Engraving.

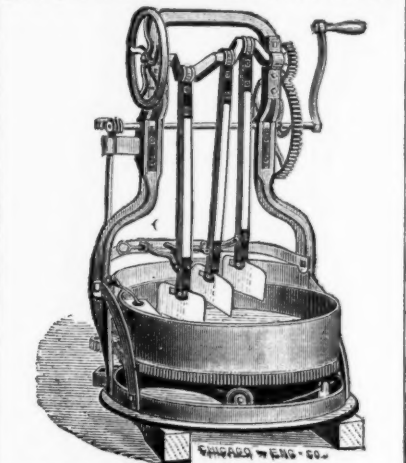
No. 14. Artistic Pen. Flexible, with extra fine Point. This exquisite and truly celebrated Pen is the Best Pen extant for Fine Ornamental Writing.

No. 15. The Quill. Point extra fine. Admirably adapted to all kinds of Fine writing.

Simple Cards containing all the FIFTEEN Numbers, securely enclosed, will be sent by mail on receipt of 25 cents.

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135 & 140 Grand St. N. Y.

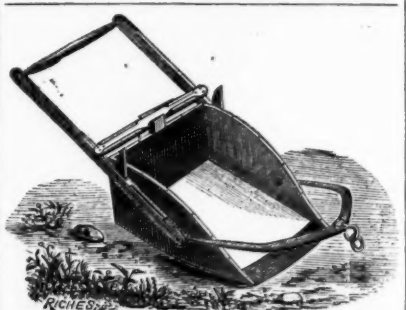
DRAW-CUT BUTCHERS' MACHINES.



SAUSAGE CHOPPERS AND STUFFERS. LARD PRESSES.

First premium medals in 1874 at New York, Boston and Cincinnati. For Sale to the Hardware Trade.

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REVOLVING SCRAPER COMPANY, Columbus, O.

Manufacturers of Doty's Revolving Road Scrapers, Mammoth Road Plows, and R. & C. and Canal Barrows, with Pat. Wheels. Send for Circular and Price List.



Jewett's Patent Filter WITH **PORCELAIN LINED COOLER.**

Acknowledged the only Complete Filter and Cooler in the world.

Hardware, House-furnishing and Crockery dealers can find no more salable article, as this Filter is perfect in its work of purifying water of every kind, attractive in appearance, &c., &c. Send for illustrated circular.

MANUFACTURED ONLY BY **JOHN C. JEWETT & SONS, Buffalo, N. Y.**

NEW MODEL DERINGER REVOLVER.

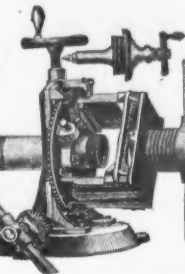


22 Cal. 7 Shot.

An exact model of S. & W. No. 1 Revolver.

This arm is Half Nickel Plated, and is equal in style of finish to the best arms in the country. Quality of workmanship and material first-class, and guaranteed in every respect. Price less than any other Hinge Barrel Cartridge Revolver in the market.

Sole Agents, **EDWARD K. TRYON, Jr. & CO.,** General Dealers, No. 19 North Sixth Street and No. 220 North Second Street, PHILADELPHIA.



PORTABLE PIPE AND BOLT Threader and Cutter

Cuts off and threads from ½ inch to 3 inch Pipes and Bars. Also taps Nuts and Centers work ready for Lathe. One man can thread 3 inch Pipe with ease with Dies furnished with each Machine. No Pipe splitting; no bevel inside or out. Requires no skilled labor.

A Full Set of Sockets and Lengths for Making Nipples Furnished with each Machine.

ANY SOLID DIE CAN BE USED IN THIS MACHINE.

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CENTENNIAL SELF-LUBRICATIVE

Hemp Piston Packing

FOR Locomotives, Steamships, Stationary Engines, Hot or Cold Water Pumps.

Recommended by Master Mechanics and Engineers, as the cheapest and best in market. No more Extortionate Prices. No more Fluted Rods—but a good article at fair price.

JOHN CANFIELD & CO., SOLE MANUFACTURERS,

Office, 1321 Fairmount Ave., Phila.

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Manufacturers of the



FASHION for Wood.

With or without Iron Clad, Copper Low Reservoir, and the Celebrated **MONITOR Coal and Wood Cook.**

MICHIGAN STOVE CO., Detroit Mich.

Awarded First Premium at Michigan State Fair, 1874.



Manufacturers of

COOKING, PARLOR AND HEATING STOVES.

Made from the Best Brands of Lake Superior Charcoal and other First Class Brands of Iron. Also Manufacture for The Western Trade.

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J. R. HUTCHINSON & CO., Manufacturers of **PATENT STOP GATES** For Water, Gas and Steam,

From 2 in. to 50 in. diameter. Also, Fire Hydrants, Single and Double Nozzle.

Improved Boiler Feeders, Etc. Cor. Park Way & Sandusky Sts., ALLEGHENY, PA.

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HENRY DISSTON & SONS, Keystone Saw, Tool, Steel and File Works,

Front and Laurel Streets, Philadelphia.

MANUFACTURERS OF

SAWS OF EVERY DESCRIPTION, FILES, &c.

Also Sheet Steel and Articles made from Sheet Steel.

Branch Works, Tacony, Philadelphia.

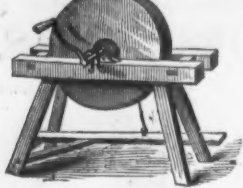
Branch House, Randolph & Market Streets, Chicago, Ill.

HENRY DISSTON & SONS desire to call the attention of the Hardware Trade, also the Mechanics of this Country, to their



"NEW PATENT SKEW BACK HAND SAW,"

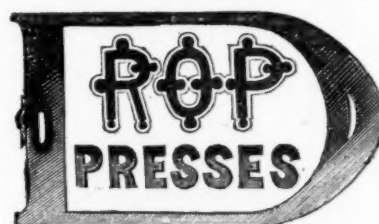
which has been pronounced by all first-class workmen who have used it, to be eminently superior in every respect to the old style hand saw. Its advantages are manifold, the peculiar formation of the blade actually stiffening and strengthening it in a remarkable degree, and the recess in the handle allowing the introduction of the thumb of the left hand and giving the operator full power to manipulate the saw, and the principle of bedding the handle in the blade bringing the operator closer to his work, an advantage will be readily appreciated by any mechanic. It is a singular fact that while vast improvements are constantly being made in all other kinds of saws, the hand saw of to-day in shape and style is similar to the hand saw of centuries ago. Recent experience has proved that it is as susceptible of improvement as any other saw. Our aim and object has ever been to assist the mechanic and lighten his toil, and one trial of our **NEW PATENT SKEW BACK HAND SAW** will prove how well we have succeeded.

Grindstones, Emery, &c.**Walter R. Wood,
GRINDSTONES.**SOLE AGENT OF THE
BEREA STONE CO., of Ohio.
NOVA SCOTIA and other brands.
283 & 285 Front Street, New York.**Grindstones.****AMHERST,
INDEPENDENCE,
LAKE HURON,
AND BERA.****Also Scythe Stones.****WORTHINGTON & SONS, Mfrs.,**
North Amherst, Ohio.**EMERY WHEELS AND MACHINERY**

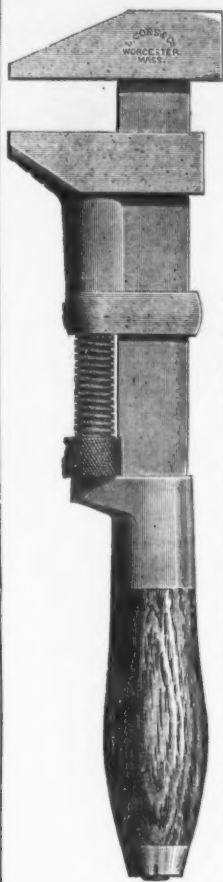
Upon which to run the same, of all kinds.

EMERY  **DIAMOND**
Emery Cloth, Tools,
Mill Stone, Oil Stones,
CEMENT. Soapstone Register Borders.
For particulars, address,**UNION STONE CO.,**

6 Exchange and 26 Devonshire Streets, Boston, Mass.

THE LEHIGH VALLEY
Emery Wheel Co.,
Weissport, Penn.
Manufacturers of
"LEHIGH" Emery
Wheels and Machines.
Send for Circulars.**Rocky Mountain Vermilion Paint**is "Nature's Compound" of Copper, Mercury, Lead and iron. A pure Oxide of Metals, containing no earthy matter, hence we claim, and are prepared to prove that it is the best and Cheapest Paint in the market. Properly mixed, we will guarantee it to cover double the surface and wear twice as long as ordinary paints. It will not peel, scale, crack or blister, though subjected to high degrees of heat. It will effectually prevent the Corrosion of Metals, even in mid ocean. Warranted superior to red lead or any other lead, for any and all purposes for which paint is required. Please send for circulars. All orders should be addressed, **Wm. H. Corey,** General Agent, 27 Sabin St., Providence, R. I.**Bennett Hotchkiss and
N. C. Stiles' Patent.**This Drop (which has been illustrated in this journal of that class in which the Hammer is raised by a stiff belt or board passing up between two friction rolls, and is so well known that we will only describe our improvements. The patents we are working under are those of **BENNETT HOTCHKISS** (who in an interference case with Goulding and Cheney was declared the first inventor) and **N. C. STILES.** Our improvements consist:
First.—Of an arrangement of parts that makes it the most complete Jobbing Hammer, and will take the place, to a great extent, of all other kinds for forging. In addition to the upright rod, which is operated by the hammer to open and close the rolls, we place another rod the lower end of which is secured to the end of a lever which is operated by the hand or foot, which operation also opens and closes the rolls at will. The lower end of this rod has a slot, so that the action of the hammer will not disturb the hand lever, thereby preventing the hand being injured, as otherwise would be the case.
Second.—No dog is used on the upright to hold up the hammer. The belt or board passes up between two clamps situated under the rolls, so arranged that as the hammer ascends they will freely open of themselves, but on descending they will close and hold up the hammer. To let the hammer fall the clamps are opened by pressure upon the foot treadle.
Third.—The board or belt is secured to the hammer by an elastic connection, which prevents the sudden jar and destruction of the same. The back roll is made adjustable to different thicknesses of board or belt, as also are the clamps. An adjustable collar on the upright rod allows the operator to obtain any height of blow desired automatically. If one blow is wanted, press upon the treadle and remove the pressure as soon as the blow is given. Keep the foot upon the treadle and the blow will be repeated until the pressure is removed. If a blow of less height than the collar is set for is required, work the hand lever, which will give you any height of blow desired. The hammer can be held up at any point below the collar by bringing the hand lever into action when the hammer is at the desired height, so that the next blow can be given from a state of rest, of less height than the collar is set for. This is a feature no other drop has; that is, the first blow struck can be of less height than the second or third, and obtained from a state of rest. A gentle pressure upon the treadle will allow the hammer to go down slowly, but it will stop and remain suspended at any point as soon as the pressure is removed.
The clamps in holding up the hammer keep the board from touching either roll and prevents the same from being worn uneven.

Manufactured only by the

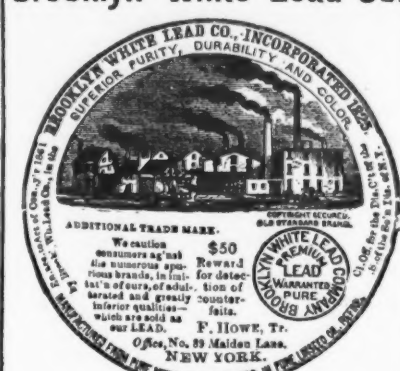
Stiles & Parker Press Co.,
MIDDLETOWN, CONN.**L. COES' Genuine Improved Patent
SCREW WRENCHES.**Manufactured by
L. COES & CO.,
Worcester, Mass.Established  In 1839.
Registered March 21, 1874.We invite the particular attention of the trade to our New Straight Bar Wrench, *widened*, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to any strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the fact, that in 1869 we made several important improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes, which were at once closely imitated and sold as the *Genuine Wrench* by certain parties who seem to rely upon our improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be good evidence that we manufacture a superior Wrench, we wish the trade may not be deceived on the question of originality. Trusting the trade will fully appreciate our recent efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped.**"L. COES & CO."**Warehouse, 97 Chambers St., & 81 Reade Sts., N. Y.
HORACE DURRIE & CO., Sole Agents.**Ausable Horse Nail Co.**
MANUFACTURERS OF
**HAMMERED,
HORSE NAILS,**Hammer Pointed, Polished & Blued
FROM
BENZON IRON.
Orders promptly filled at lowest market rates.
ABRAHAM BUSSING, Secretary,
35 Chambers Street, New York**GLOBE NAIL COMPANY,**
MANUFACTURERS OF
Pointed, Polished & Finished Horse Shoe Nails

Recommended by over 20,000 Horse Shoers.

All Nails made from best NORWAY IRON, and warranted perfect and ready for driving. Orders filled promptly and at lowest rates by

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Orleans Scythe Stone Co.**FORTY-SECOND YEAR.**Goods stamped "D. R. Barton & Co." are NOT made by me.
For GENUINE "D. R. Barton" Edge Tools, Planes, Axes, &c., be sure to address **D. R. BARTON,** and NOT D. R. Barton & Co.
Factory and Office, Mill Street, cor. of Furnace.
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AND PAINTERS' COLORS.**TRADE MARK.
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White Lead, Red Lead, Litharge & Orange Mineral.
Offices, 31st St. below Chestnut, PHILADELPHIA.**Brooklyn White Lead Co.**TRADE MARK.
**White Lead, Red Lead and
Litharge.**
89 Maiden Lane, NEW YORK.
FISHER HOWE, Treas.**JOHN JEWETT & SONS**
Manufacturers of the well known Brand of
WHITE LEAD.TRADE MARK.
Also Manufacturers of
**LINSEED OIL
AND FLOOR OIL CLOTHS.**
182 Front Street NEW YORK

P. O. BOX 3760.

UNION HARDWARE CO.,

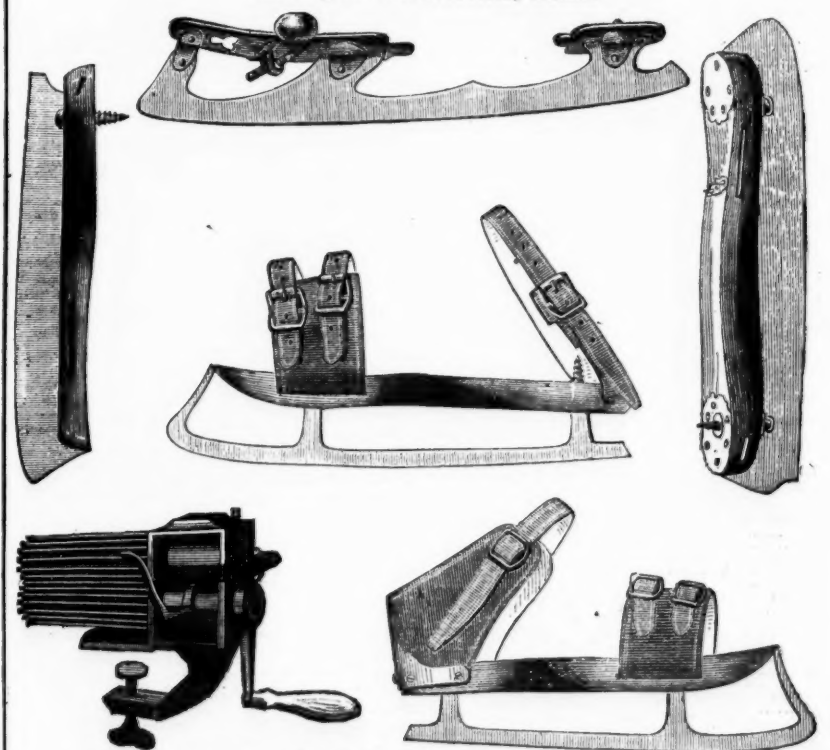
MANUFACTURERS OF

**Skates, Skate Straps, Handles,
BASE KNOBS, WOOD TURNINGS.**

Also Dog Collars, Muzzles, Empire Fluting Machines, &c.

120 Chambers and 50 Warren Streets, NEW YORK.

Factory at Wolcottville, Conn.



Send for Catalogue.

Our Illustrated Catalogue is now ready for the fall trade of 1874, representing a full assortment of the largest and best stock of Skates in the market.
Also a full line and large stock of goods suited to the wants of the trade. Our extensive facilities for producing wood goods enables us to offer very low prices to manufacturers using large quantities of handles.

ESTABLISHED A. D. 1833 and 1855.

JACOBUS & NIMICK MFG. CO.,

PROPRIETORS OF

Pittsburgh Novelty Works & Pittsburgh Variety Works,

Manufacturers of

LOCKS AND LATCHES.

Fairbanks' Standard Platform and Counter Scales, Paint and Coffee Mills Builders' and Domestic Hardware generally.

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 AMERICAN COFFEE
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 20 SIZES
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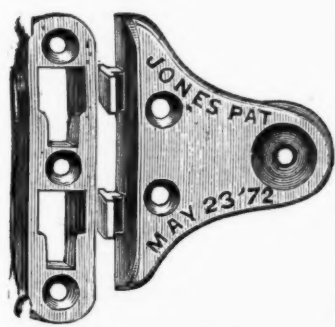
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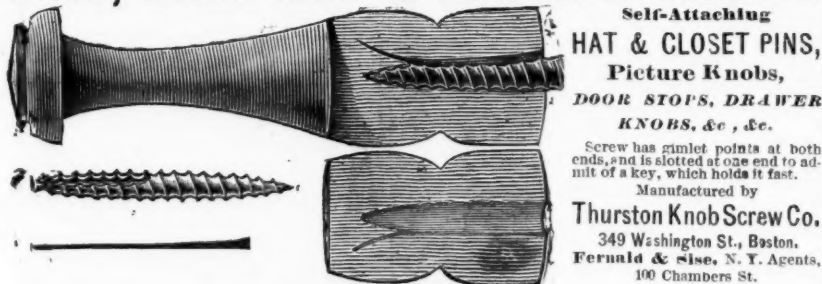
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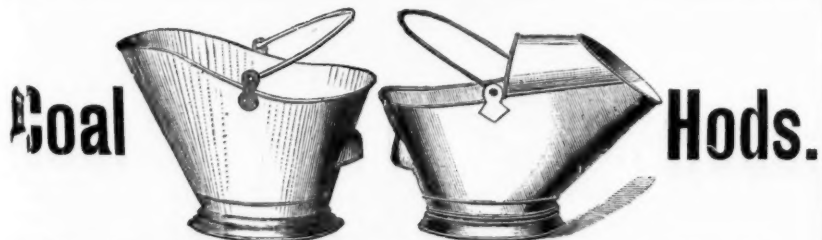


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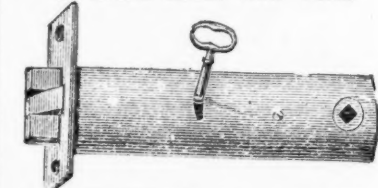
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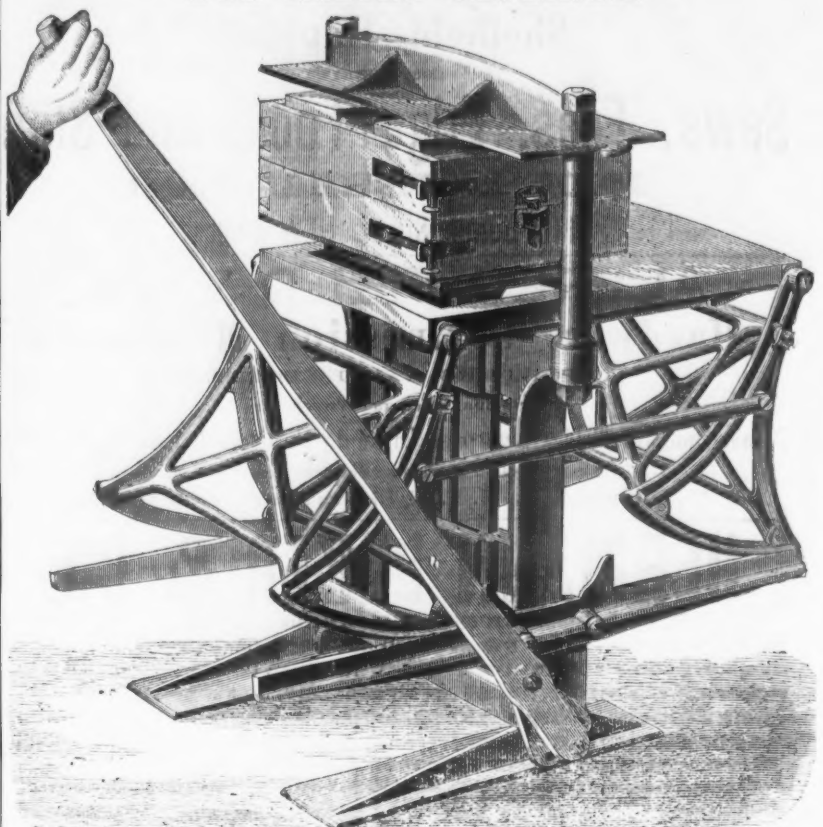
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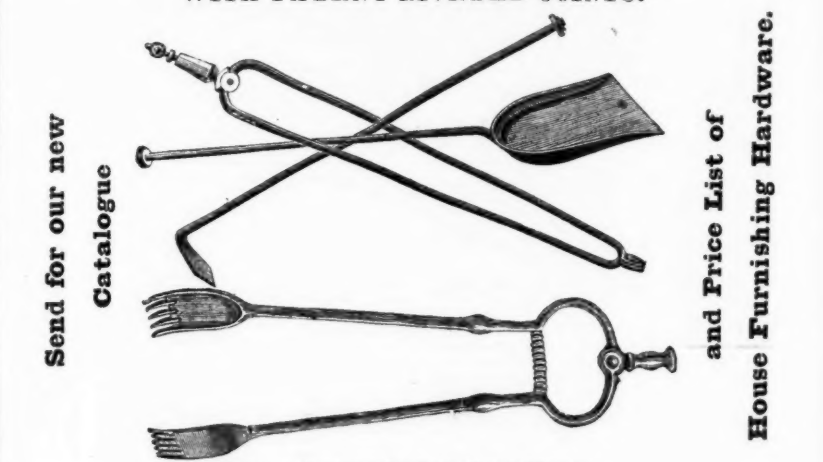
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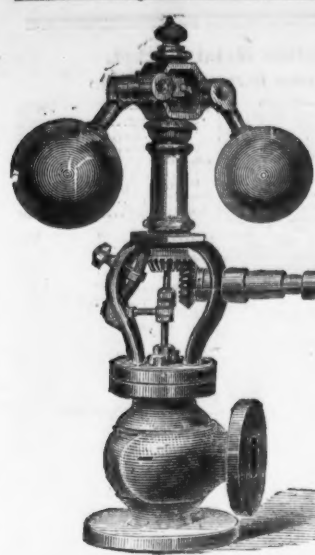
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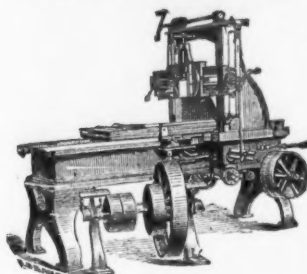
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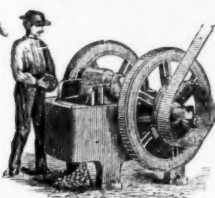
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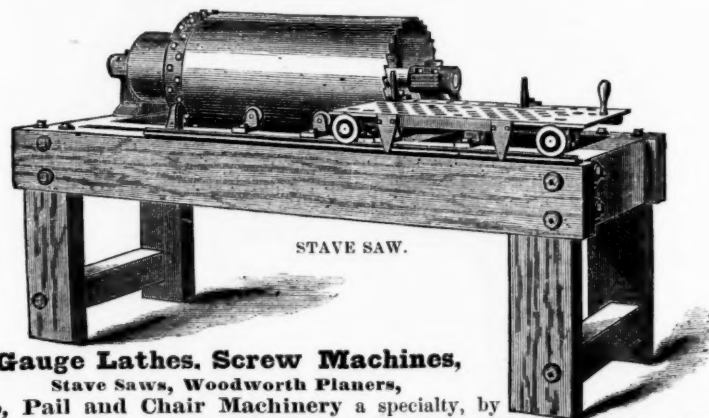
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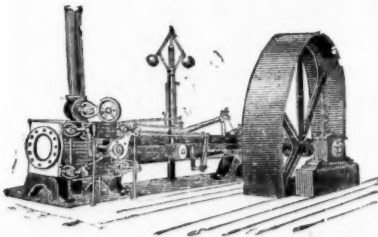
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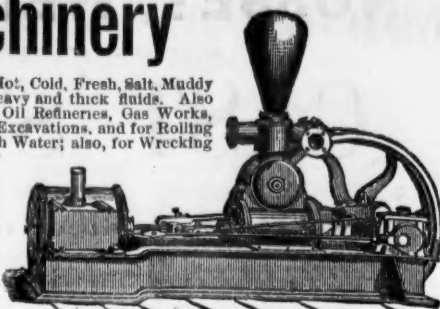
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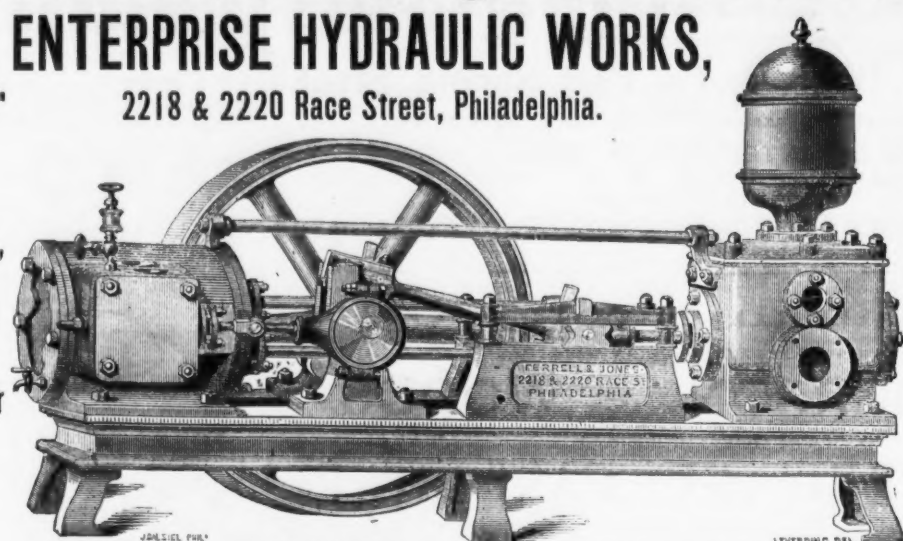
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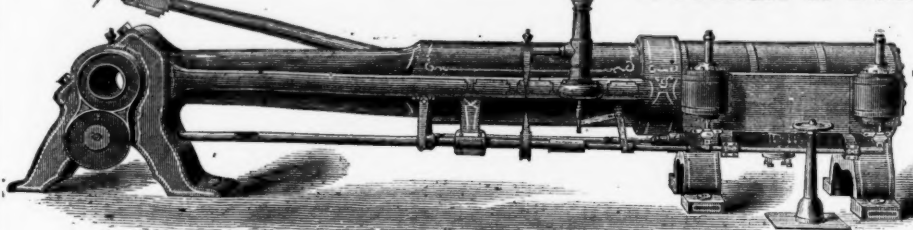
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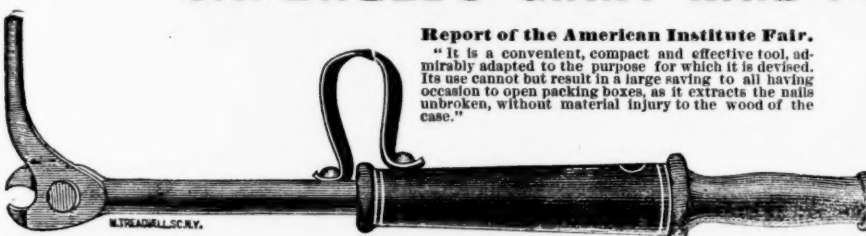
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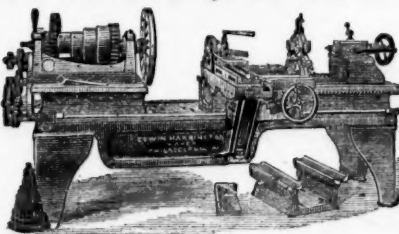
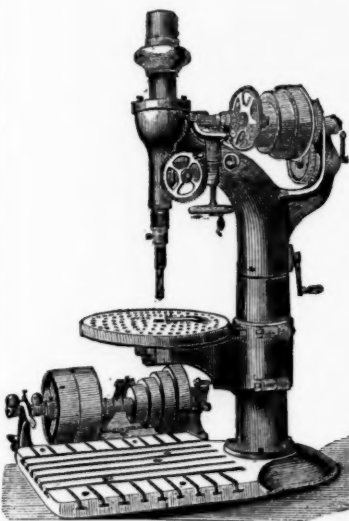
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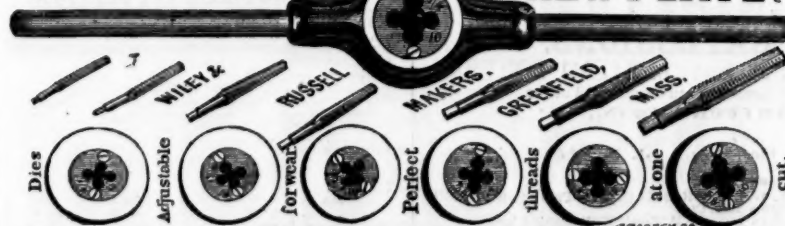
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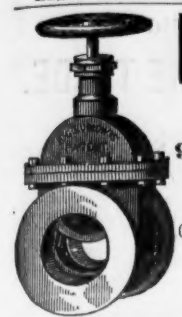
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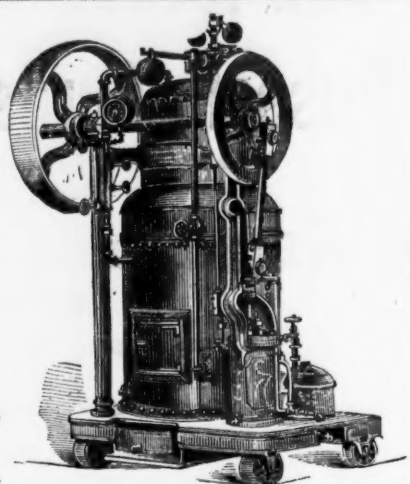
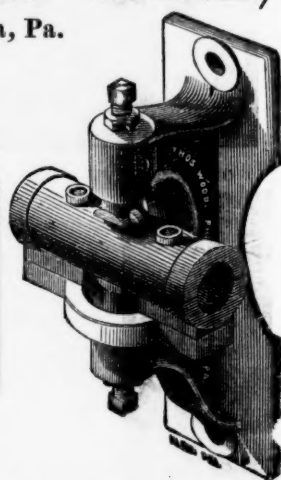
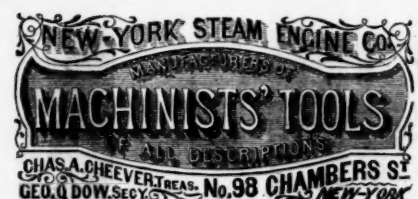
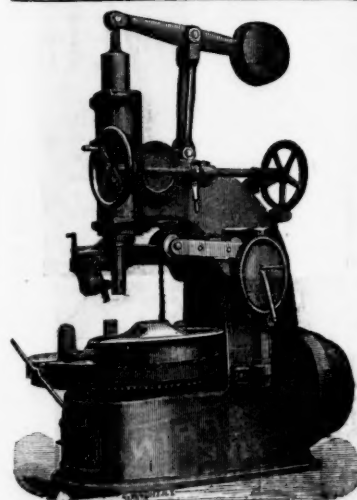
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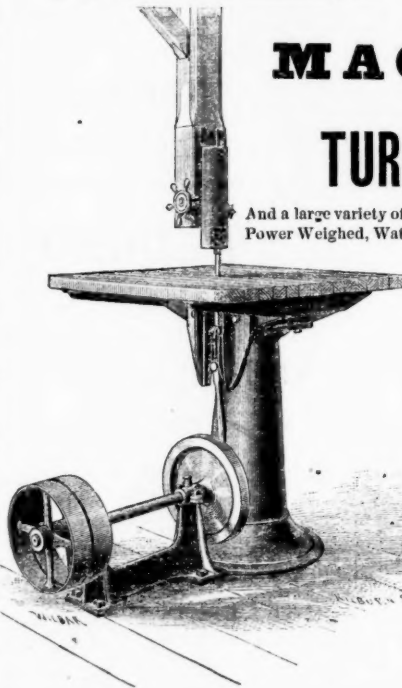
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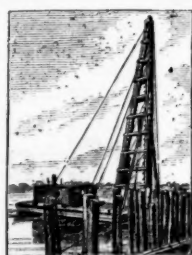
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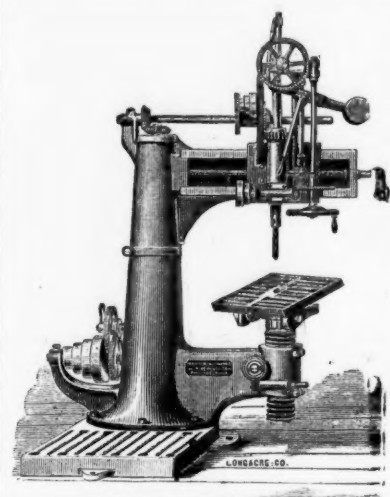
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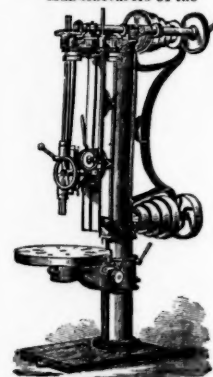
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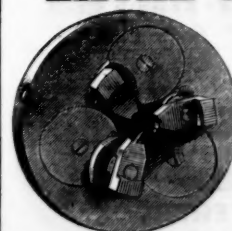
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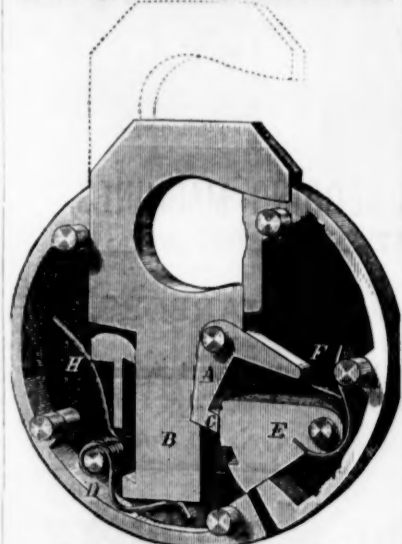
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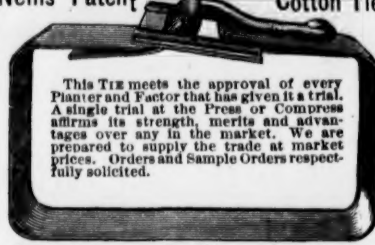
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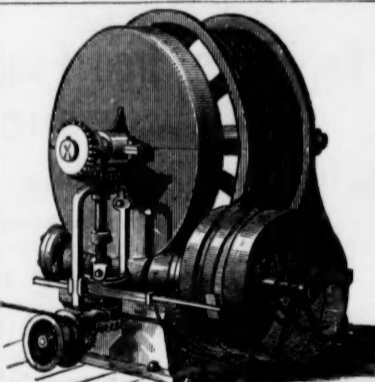


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